OMB No. 2040-0042 Approval Expires 12/31/2018

EPA

United States Environmental Protection Agency
Washington, DC 20460

Completion Form For Injection Wells

Administrative Information

1. Permittee: Florence Copper Inc.

Address *(Permanent Mailing Address) (Street, City, and ZIP Code)*: 1575 W Hunt Hwy, Florence, AZ 85132

2. Operator: Florence Copper Inc.

Address *(Street, City, State and ZIP Code)*: 1575 W Hunt Hwy, Florence, AZ 85132

3. Facility Name: Florence Copper Inc.

Telephone Number: (520) 374-3984

Address *(Street, City, State and ZIP Code)*: 1575 W Hunt Hwy, Florence, AZ 85132

4. Surface Location Description of Injection Well(s)

State: Arizona

County: Pinal

Surface Location Description

SW 1/4 of SW 1/4 of NE 1/4 of SW 1/4 of Section 28 Township 4S Range 9E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 1155 ft. frm (N/S) N Line of quarter section
and 1180 ft. from (E/W) E Line of quarter section.

Well Activity

- [ ] Class I
- [ ] Class II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [x] Class III
- [ ] Other

Well Status

- [x] Operating
- [ ] Modification/Conversion
- [ ] Proposed

Type of Permit

- [ ] Individual
- [x] Area : Number of Wells 33

Lease Number: NA

Well Number: O-05B

Submit with this Completion Form the attachments listed in Attachments for Completion Form.

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Ian Ream, Senior Hydrogeologist		9-12-2018

EPA Form 7520-9 (Rev. 12-11)

Attachments to be submitted with the Completion report:

I. Geologic Information

1. Lithology and Stratigraphy

A. Provide a geologic description of the rock units penetrated by name, age, depth, thickness, and lithology of each rock unit penetrated.

B. Provide a description of the injection unit.

(1) Name
(2) Depth (drilled)
(3) Thickness
(4) Formation fluid pressure
(5) Age of unit
(6) Porosity (avg.)
(7) Permeability
(8) Bottom hole temperature
(9) Lithology
(10) Bottom hold pressure
(11) Fracture pressure

C. Provide chemical characteristics of formation fluid (attach chemical analysis).

D. Provide a description of freshwater aquifers.

(1) Depth to base of fresh water (less than 10,000 mg/l TDS).
(2) Provide a geologic description of aquifer units with name, age, depth, thickness, lithology, and average total dissolved solids.

II. Well Design and Construction

1. Provide data on surface, intermediate, and long string casing and tubing. Data must include material, size, weight, grade, and depth set.

2. Provide data on the well cement, such as type/class, additives, amount, and method of emplacement.

3. Provide packer data on the packer (if used) such as type, name and model, setting depth, and type of annular fluid used.

4. Provide data on centralizers to include number, type and depth.

5. Provide data on bottom hole completions.

6. Provide data on well stimulation used.

III. Description of Surface Equipment

1. Provide data and a sketch of holding tanks, flow lines, filters, and injection pump.

IV. Monitoring Systems

1. Provide data on recording and nonrecording injection pressure gauges, casing-tubing annulus pressure gauges, injection rate meters, temperature meters, and other meters or gauges.

2. Provide data on constructed monitor wells such as location, depth, casing diameter, method of cementing, etc.

V. Logging and Testing Results

Provide a descriptive report interpreting the results of geophysical logs and other tests. Include a description and data on deviation checks run during drilling.

VI. Provide an as-built diagrammatic sketch of the injection well(s) showing casing, cement, tubing, packer, etc., with proper setting depths. The sketch should include well head and gauges.

VII. Provide data demonstrating mechanical integrity pursuant to 40 CFR 146.08.

VIII. Report on the compatibility of injected wastes with fluids and minerals in both the injection zone and the confining zone.

IX. Report the status of corrective action on defective wells in the area of review.

X. Include the anticipated maximum pressure and flow rate at which injection will operate.

HALEY & ALDRICH, INC.
One Arizona Center
400 E. Van Buren St., Suite 545
Phoenix, AZ 85004
602.760.2450

TECHNICAL MEMORANDUM

14 September 2018
File No. 129687-010

TO: Florence Copper Inc.
Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.
Lauren Candreva, R.G.

Subject: Drilling, Installation, and Integrity Testing Summary
PTF Observation Well O-05B
Florence Copper Inc., Florence, Arizona

This document describes drilling, installation, and testing of the Production Test Facility (PTF) observation well O-05B for Florence Copper Inc. (Florence Copper) in Florence, Arizona, including a description of the equipment used to perform the work, details of the completed work, and the results of well testing activities. Separate well completion reports have been created for each PTF well.

The Arizona Department of Water Resources Registry ID for well O-05B is 55-227234; the Well Registry Report is included in Appendix A. Well O-05B is located in the southeast quarter of the northwest quarter of the southwest quarter of Section 28 of Township 4 south, Range 9 East of the Gila and Salt River Baseline and Meridian (D(4-9)28CBD). Well O-05B is located within the Underground Injection Control (UIC) Permitted Area of Review (AOR) for UIC Permit R9UIC-AZ3-FY11-1 and was completed as a Class III observation well for the PTF (Figure 1).

Florence Copper contracted National Exploration, Wells, & Pumps (National) to drill, install, and test well O-05B in accordance with *Bid Specification: Drilling, Installation, and Testing of Class III Observation Wells, Production Test Facility, Florence, Arizona* (Haley & Aldrich, Inc. [Haley & Aldrich], 2017). A Schramm T685WS drilling rig was used for all drilling and construction activities. Haley & Aldrich provided intermittent oversight of drilling activities and complete oversight of key activities including: geophysical logging, well installation, and testing. All reported depths are in feet below ground surface (bgs) unless otherwise noted.

I. Geologic Information

1. Lithology and Stratigraphy

A. Geology of Penetrated Units

The geology penetrated during the drilling of the Class III Well O-05B is summarized in the table below and a lithologic log is included in Appendix B.

Lithologic Unit Name	Depth to Bottom of Unit (feet)	Thickness of Unit (feet)	Lithology and Age of Unit
Upper Basin Fill Unit (UBFU)	282	282	Alluvium; Quaternary to Tertiary
Middle Fine-Grained Unit (MFGU)	303	21	Alluvium; Tertiary
Lower Basin Fill Unit (LBFU)	384	81	Alluvium; Tertiary to Cretaceous
Bedrock Oxide Unit (Oxide)	Not encountered	>836	Igneous porphyry – Precambrian

B. Description of Injection Unit

Name	Bedrock Oxide Unit
Depth Drilled	1,220 feet
Thickness	>836 feet
Formation Fluid Pressure	Atmospheric plus head of freshwater – no additional formation pressure
Age of Unit	Precambrian with intrusions of Precambrian to Tertiary rocks
Porosity[1]	Approximately 6 to 8.5%
Permeability	Hydraulic Conductivity = 0.56 feet per day
Bottom Hole Temperature	34.5 degrees Celsius
Lithology	Igneous porphyry – quartz monzonite, granodiorite with diabase and andesite dykes (detailed log included in Appendix B)
Bottom Hole Pressure	Approximately 430 pounds per square inch (PSI) (pressure exerted by the column of freshwater with no additional contribution from formation pressure)
Fracture Pressure	0.65 PSI per foot

[1] Porosity values for the bedrock oxide unit are approximate values from calculated neutron porosity values from injection well borehole surveys.

C. Chemical Characteristics of Formation Fluid

The chemical characteristics of the formation fluid in the injection zone are summarized below and the results of the sampling of the center PTF wellfield well R-09. The table below summarizes the primary chemical characteristics detected in a formation fluid sample collected on 23 April 2018. The complete analytical report is included in Appendix C.

Analyte	Result (mg/L)
Metals	
Aluminum	<0.08
Antimony	<0.005
Arsenic	0.0016
Barium	0.071
Beryllium	<0.0005
Cadmium	<0.00025
Calcium	140
Chromium	0.0051
Cobalt	<0.00025
Copper	0.011
Iron	<0.30
Lead	<0.0005
Magnesium	27
Manganese	0.002
Mercury	<0.001
Nickel	0.0033
Potassium	6.8
Selenium	<0.0025
Sodium	170
Thallium	<0.0005
Zinc	<0.04
Anions	
Bicarbonate	150
Chloride	310
Fluoride	<0.5
Nitrate	8.8
Sulfate	190
Field Parameters	
Total Dissolved Solids	1,000
pH	7.8
Radiochemicals	
Uranium	0.016
Notes: *mg/L = milligrams per liter*	

Results of the sampling of well O-05B are included in the *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings* (Brown and Caldwell, 2018).

D. Description of Freshwater Aquifers

1) The depth to the base of the freshwater aquifer is defined by the interface where deeper formation fluid exhibits a total dissolved solids (TDS) value of 10,000 milligrams per liter (mg/L). The depth of the 10,000 mg/L interface is deeper than all of the wells drilled at the site and consequently has not been defined.

2) The geologic description of the aquifer units is included below:

Aquifer Unit Name	Age	Depth (feet)	Thickness (feet)	Lithology	Average Total Dissolved Solids[1] (mg/L)
UBFU	Quaternary/Tertiary	0 to 282	282	Alluvium	914
LBFU	Tertiary	303 to 384	81	Alluvium	754

[1] Average TDS values calculated from UBFU and LBFU monitoring well ambient monitoring results near the PTF.

II. Well Design and Construction

1. Well O-05B Casing Installed:

Casing	Material	Diameter (inches)	Weight (pounds per foot)	Depths (feet)	Borehole Diameter (inches)	Drilling Method
Surface	Mild Steel	14 O.D. 13⅜ I.D.	47.36	0 to 40	24	Solid-stem auger
Well Casing	Fiberglass Reinforced Plastic	5.47 O.D. 4.74 I.D.	5.40	-2.0 to 450	12¼	Reverse Flooded Rotary
Screen	PVC SCH80 with 0.020-inch wide slots	5.56 O.D. 4.81 I.D.	4.08	450 to 1,200	12¼	Reverse Flooded Rotary

Notes:
I.D. = inside diameter
O.D. = outside diameter
PVC = polyvinyl chloride
SCH = Schedule

2. Well Cement

Cement Interval	Cement Type	Additives	Amount Installed (cubic yards)	Method of Emplacement
Surface Casing	Type V Neat 21 sack slurry	None	7[1]	Submerged tremie
Well Casing	Type V Neat 21 sack slurry	None	14.5	Submerged Tremie
[1] Surface casing cement mixed by drilling contractor, volume estimated.				

Field forms documenting pipe tallies, annular materials, and cement tickets are included in Appendix D.

3. Annular Packers

No annular packers were used during construction of well O-05B.

4. Centralizers

Casing	Centralizer Type	Number and Spacing
Well – FRP and PVC	Stainless steel – Heavy Duty	30 installed – every 40 feet
Notes: *FRP = fiberglass reinforced plastic* *PVC = polyvinyl chloride*		

5. Bottom Hole Completion

There is no bottom hole completion as this is not an oil/gas well. The well was completed at the bottom with a stainless-steel endcap of the same diameter as the well screen.

6. Well Stimulation

No well stimulation was used during the drilling and construction of well O-05B.

III. Description of Surface Equipment

1. Surface Equipment

Well O-05B is an observation well and has been equipped with a pressure transducer for monitoring water level and a low-flow pump for collecting fluid samples for analysis of specific conductance. A diagram of the wellhead is included in the well as-built in Figure 2.

IV. Monitoring Systems

1. Well Monitoring Equipment

Equipment Type	Location	Type	Purpose
Pressure Transducer	Well Casing	Recording	Monitor water column/pressure
Electrical Conductivity Sensors	Well Annulus	Non-recording	Monitor formation conductivity
Annular Conductivity Sensors	Well Annulus	Non-recording	Monitor formation conductivity

2. Monitoring Wells

There are a total of 16 monitoring wells associated with the PTF: 7 point-of-compliance (POC) wells, 7 United States Environmental Protection Agency (USEPA) supplemental monitoring wells, and 2 operational monitoring wells. The POC wells are located outside the AOR and are not constructed as Class III wells. The supplemental monitoring and operational monitoring wells are located within the AOR and are constructed as Class III wells as required by the UIC Permit. The wells are summarized in the tables below by type.

POC Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval (feet)**	**Screened Lithologic Unit**
M14-GL	846750.23 746461.52	859	5 9/16 OD	Submerged tremie	778 to 838	LBFU
M15-GU	846697.17 746464.82	615	5 9/16 OD	Submerged tremie	554 to 594	LBFU
M22-O	846751.26 746514.47	1,140	5 9/16 OD to 528 feet; 4½ OD to 1,140 feet	Submerged tremie	932 to 1,130	Oxide
M23-UBF	846688.13 746512.48	250	6 5/8 OD	Submerged tremie	210 to 250	UBFU
M52-UBF	851092.00 774178.00	274	5 9/16	Submerged tremie	198 to 273	UBFU
M54-LBF	847331.96 746682.61	630	5 9/16	Submerged tremie	310 to 629	LBFU
M54-O	847342.99 746702.36	1,199	5 9/16	Submerged tremie	668 to 1,198	Oxide

Supplemental Monitoring Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval (feet)**	**Screened Lithologic Unit**
M55-UBF	847541.46 746280.63	261	5	Submerged tremie	240 to 260	UBFU
M56-LBF	847518.70 746303.41	340	5	Submerged tremie	320 to 340	LBFU
M57-O	847378.37 746248.93	1,200	5	Submerged tremie	523 to 1,199	Oxide
M58-O	847672.23 746595.97	1,200	5	Submerged tremie	594 to 1,199	Oxide
M59-O	847934.95 746218.89	1,201	5	Submerged tremie	534 to 1,199	Oxide
M60-O	847599.37 745903.70	1,201	5	Submerged tremie	444 to 1,200	Oxide
M61-LBF	848184.46 746148.88	629	5	Submerged tremie	429 to 629	LBFU

Operational Monitoring Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval (feet)**	**Screened Lithologic Unit**
MW-01-LBF	847487.97 746360.54	444	5	Submerged tremie	330 to 440	LBFU
MW-01-O	847499.04 746369.31	1,200	5	Submerged tremie	500 to 1,200	Oxide

V. Logging and Testing Results

Borehole geophysical logging was conducted on well O-05B in two phases: 1) open-hole surveys in the 12.25-inch borehole prior to installation of the well casing and screen, and 2) cased-hole surveys in the completed well.

The open-hole geophysical surveys completed at well O-05B included:

- Spontaneous potential;
- Natural gamma;

- Electrical resistivity (short and long normal);
- Caliper with calculated volume;
- Temperature;
- Sonic; and
- Deviation.

The cased-hole geophysical surveys completed included:

- Sonic (for cement bond with fiberglass reinforced plastic [FRP]);
- 4 Pi Density (for cement bond with FRP);
- Dual Density (for cement bond with FRP); and
- Video Survey.

Open-hole geophysical surveys were used to support identification of the lithologic contacts, to evaluate the condition of the borehole, and to evaluate the deviation of the borehole.

The primary logs used to evaluate lithologic contacts are natural gamma ray, short (16-inch) and long (64-inch) normal electrical resistance, and single-point resistance. The lithologic contacts for the Middle Fine-Grained Unit (MFGU) were selected based on the short and long resistance and the single-point resistance. All the resistivity logs decreased and stayed consistently low through the MFGU. This contact is generally a relatively sharp decrease in resistance at the top of the unit and a gradual increase in resistance below the bottom of the unit.

The contact between the Lower Basin Fill Unit (LBFU) and the bedrock was identified primarily with natural gamma and correlated with the resistance logs. There is a consistent increase in gamma at the contact between the LBFU and the bedrock that had been identified and documented at the site during exploration in the 1990s. For well O-05B, the gamma averages approximately 70 American Petroleum Institute (API) units throughout the Upper Basin Fill Unit (UBFU) and MFGU, a slight increase to approximately 80 to 90 API units in the LBFU, and an increase beginning at approximately 370 up to 384 feet to over 120 API units. After the increase at 384 feet, the natural gamma begins to vary significantly more than it did in the alluvial units. This change in the response of the natural gamma indicates the contact with the bedrock unit. Also, at this approximate depth there is an increase in the single-point resistance and the short normal resistance, indicating the formation has become more resistant. This is likely primarily due to the bedrock containing less water than the alluvial formation above.

Cased-hole geophysical surveys were conducted to evaluate the cement seal, the casing-cement bond, to document baseline fluid temperature and conductivity and to evaluate the plumbness of the well. The cement-bond is discussed in Section VII.

Copies of all the open-hole geophysical logs are included in Appendix E; a figure summarizing the open-hole logs used to evaluate geology is included as Figure 3. The cased-hole logs used to evaluate cement bond are included in Appendix F**.**

VI. Well As-Built Diagram

An as-built diagram for well O-05B is included as Figure 2.

VII. Demonstration of Mechanical Integrity

A demonstration of Part I mechanical integrity of the well was completed using a standard annular pressure test (SAPT) in accordance with Part II.E.3.a.i.A of the UIC Permit. Mechanical integrity will be demonstrated every 2 years during operations and will be confirmed by daily injection pressure monitoring that will be conducted per the UIC Permit once the well is operational. Well O-05B SAPT is summarized below.

The mechanical integrity of the blank well casing was tested by performing a SAPT on 8 August 2017. The SAPT was conducted by installing an inflatable packer in the well secured with a threaded well seal at the surface. The packer was installed near the bottom of the FRP-cased portion of the well and the wellhead was equipped with a water-tight threaded wellhead. The packer was inflated to form a seal against the casing. The bottom 5 feet of the packer drop pipe was perforated to allow for communication between the tubing and the annulus of the packer assembly. The drop pipe extended through the wellhead and a high pressure/low volume pump was attached to the drop pipe to pressurize the test interval. A valve on the drop pipe at the surface was used to isolate the test interval once the planned test pressure was achieved.

An In-Situ LevelTROLL® pressure transducer with a data logger was installed at the well head and was connected to the packer assembly annulus interval via a National Pipe Thread adapter. The LevelTROLL was used to monitor and record pressure inside the well during the SAPT. To conduct the SAPT, water was pumped from a nearby well immediately prior to testing. Before the water was pumped into the test well, the water temperature was measured to ensure that it was similar to the ambient groundwater temperature of the test well to reduce the potential of differential temperature effects on the well casing. The SAPT for the Class III well was conducted by applying hydraulic pressure to the well casing and shutting in pressure between the packer and wellhead assembly, monitoring the shut-in pressure for a 30-minute period, then measuring the volume of water returned from the well casing after the pressure was released.

On 8 August 2017, the packer was installed to approximately 412 feet and the SAPT was conducted successfully two times. The USEPA SAPT form, a table of the data, and a chart of the data is provided in Appendix G.

Part II mechanical integrity is demonstrated by the cementing records included in this report in accordance with Part II.E.3.ii.C of the UIC Permit and will be demonstrated during operations by annular conductivity monitoring on the observation and multi-level sampling wells in accordance with Part II.E.3.a.ii.A of the UIC Permit.

Cemented Interval	Cement Type	Calculated Grout Volume (cubic yards)	Installed Grout Volume (cubic yards)
Surface Casing	Type V 21 sack neat cement slurry	3.1	7
Well Casing	Type V 21 sack neat cement slurry	13.5	14.5

On 19 July 2017, a suite of geophysical logs was run over the entire length of the completed well to verify the grout seal. A summary of the logs completed to demonstrate cement bond are included in Appendix F.

There is not a bond log tool designed to evaluate cement bond with FRP casing, so the cement interval with FRP casing of well O-05B was evaluated using density logs. The logs collected included sonic, focused density, and 4pi density. Based on the measured density of the FRP cased interval of well O-05B, no significant cement deficiencies were noted in the sonic data collected from approximately 230 feet (static water level) to 429 feet, and no significant deficiencies were noted in the 4pi density data collected from 37 to 429 feet. There were some very localized, low density intervals identified in the 4pi density logs but they were insignificant, only extending 2 to 3 feet. A summary of the FRP cased data is included in the well completion summary in Appendix F.

VIII. Compatibility of Injected Waste

The Florence Copper Project is a Class III mineral extraction project and does not include the injection of any waste products of any kind. The injected fluid (lixiviant) is a carefully constituted in-situ copper recovery solution that will be recovered and recycled following injection.

The compatibility of the lixiviant was evaluated as part of the geochemical modeling completed by Florence Copper and summarized in the *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona* (Daniel B. Stephens Inc., May 2014) which was included in Attachment H of the UIC Permit Application.

IX. Status of Corrective Action on Defective Wells in the Area of Review

There are not currently any defective wells in the AOR.

X. Maximum Pressures and Flow Rates for O-05B

Maximum Operating Pressure	Maximum Flow
Atmospheric	Not applicable – observation well

This well is an observation well used to monitor hydraulic control of the PTF; no fluids will be injected and only fluid to measure specific conductivity will be extracted using the installed low-flow pump.

XI. Well Development

Well O-05B was developed by the airlift method, followed by pumping, and was completed by National using a workover rig. To purge drilling fluids and solids, on 22 June 2017 an airline was temporarily installed to approximately 1,180 feet and airlift development of the well was conducted at approximately 60 to 70 gallons per minute (gpm). During airlift development, the airlift pump was turned on and off to surge the well. Airlift development was conducted for approximately 9 hours; after 7 hours, approximately 2 gallons of AquaClear PFD® polymer dispersant was swabbed into the screened interval of the well. The discharge was clear and sand-free at the end of the airlift development period.

To pump develop the well, a submersible pump was temporarily installed to approximately 1,195 feet on 27 June 2017. Prior to pumping, the static water level was approximately 262 feet. The pump development was conducted at approximately 43 gpm; the submersible pump was periodically turned off to surge the well during development. The discharge was sand-free and visually clear after approximately 2.5 hours of pump development; however, development was continued for 10 hours. The development was concluded on 28 June 2017, at which time the discharge was sand-free with turbidity values less than 5 Nephelometric Turbidity Units. Well development forms are included in Appendix H.

XII. Well Completion

A well video survey was conducted on 19 July 2017. The video log report is included as Appendix I. The video log depths are presented in feet below the top of the casing and so vary slightly from what is recorded, but with the correction for stick up are the same.

The video log indicates the top of fill in the well is at 1202 feet.

The surveyed location for well O-05B is:

Northing (feet)	Easting (feet)	Measuring Point Elevation (feet amsl)
746042.91	847534.95	1478.43

***Notes**:*

Northing and easting locations provided in State Plane North American Datum 1983, vertical location provided in North American Vertical Datum 1988.

amsl – feet above mean sea level

XIII. Downhole Equipment

The equipment installed in well O-05B includes:

- QED® low-flow sampling pump hung on drop tubing – pump at 600 feet; and
- Pressure transducer.

The type and depth of equipment installed in each well is not constrained by the UIC Permit or the Aquifer Protection Permit (APP). This information is provided in accordance with Section 2.7.4.3 of the APP. Operational consideration may require that the type and depth of equipment may need to be changed in response to conditions observed during operations.

XIV. Deviations from Planned Well Design

Well O-05 was drilled and installed in accordance with construction procedures in the UIC Permit. However, during grouting, the contractor's drill rig and ancillary pumping equipment used to install the grout seal lost power and the grout could not be installed in one continuous lift. The initial grout was installed on 2 June 2017, but it could not be completed to surface until 5 June 2017. The construction records for well O-05 are included in Appendix J.

Once the well was completed, a suite of geophysical logs was conducted in the well to determine the integrity of the seal and it was determined that there were deficits in the cement from approximately 134 to 296 feet. Because of the deficient cement, the well was replaced with O-05B and O-05 was abandoned in accordance with site permits. Well O-05 was backfilled from the bottom of the well to 520 feet with #60 silica sand and from 511 to 513 feet with bentonite pellets. On 13 July 2018, National installed tremie pipe to the top of the bentonite seal, McMillan Blasting Services installed Pentex PETN 100 grain detonating cord extending from 5 to 380 feet, Type V neat cement grout was installed from the bottom of O-05 to surface, the tremie was pulled, and the blasting material was detonated prior to the grout curing.

Copies of the logs conducted to evaluate the seal of well O-05 and copies of the abandonment records are included in Appendix K.

Well O-05 was installed at the planned location; the replacement well O-05B was installed approximately 20 feet southwest of the original location.

XV. References

Brown and Caldwell, Inc., 2018. *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings*. September.

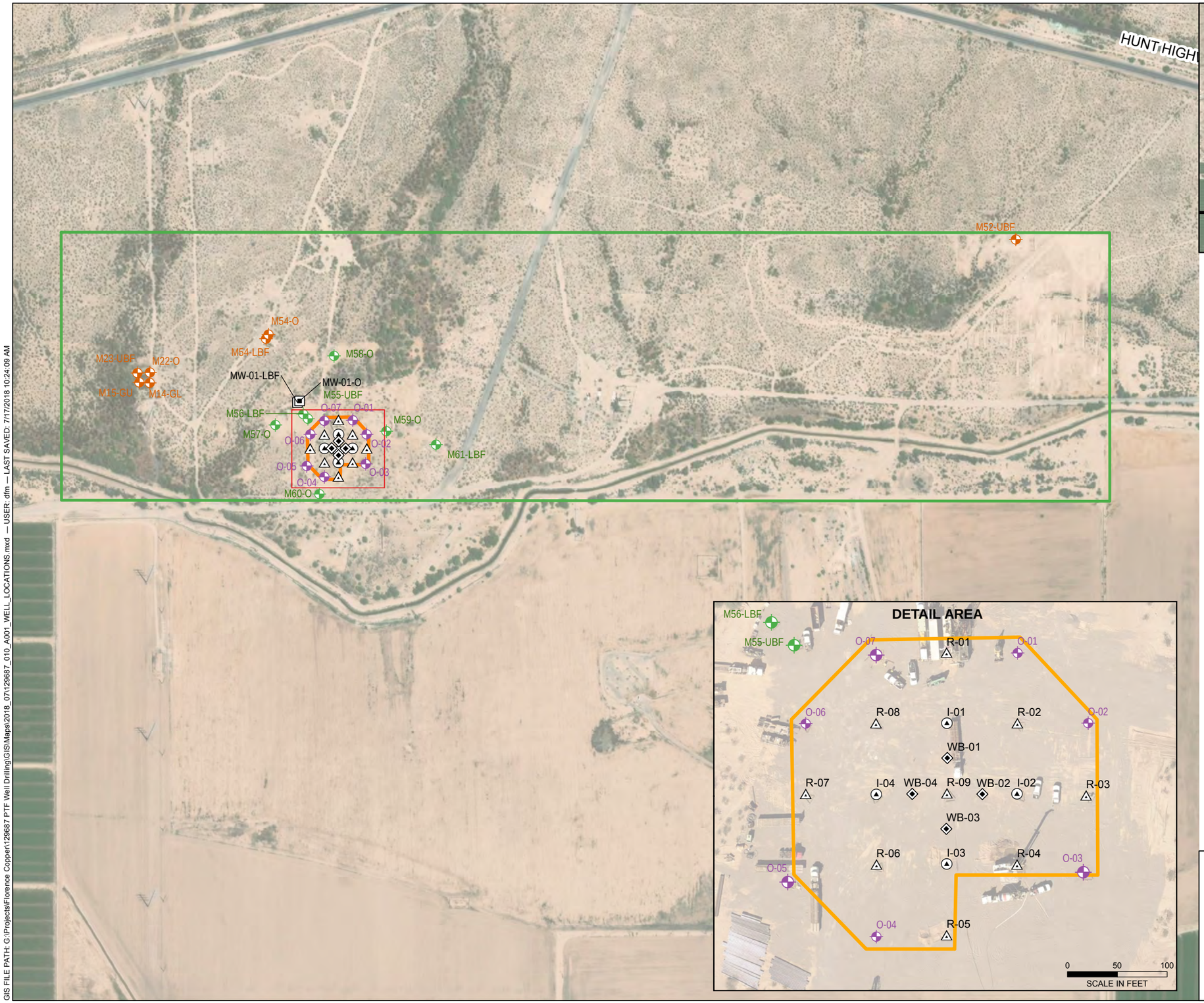
Daniel B. Stephens, Inc., 2014. *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona.* May.

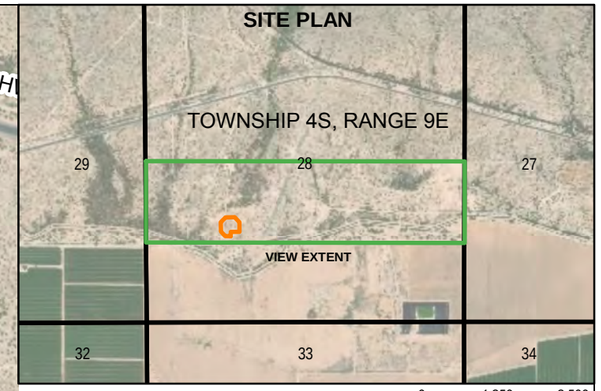
Haley & Aldrich, Inc., 2017. *Bid Specification: Drilling, Installation, and Testing of Class III Observation Wells, Production Test Facility, Florence, Arizona*. Revised September 2017.

Enclosures:

- Figure 1 – Well Locations
- Figure 2 – Well O-05B As-Built Diagram
- Figure 3 – Geophysical Data and Lithologic Log
- Appendix A – Arizona Department of Water Resources Well Registry Report
- Appendix B – Lithologic Log
- Appendix C – Chemical Characteristics of Formation Water
- Appendix D – Well Completion Documentation
- Appendix E – Geophysical Logs
- Appendix F – Cement Bond Log Summary
- Appendix G – SAPT Documentation
- Appendix H – Well Development Field Forms
- Appendix I – Well Video Log
- Appendix J – Well O-05 Completion Records
- Appendix K – Well O-05 Abandonment Records

FIGURES





LEGEND

- OBSERVATION WELL
- SUPPLEMENTAL MONITORING WELL
- POINT-OF-COMPLIANCE WELL

PTF WELL

- INJECTION
- RECOVERY
- WESTBAY WELL
- OPERATIONAL MONITORING
- PTF WELL FIELD
- STATE LAND LEASE

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

0 500 1,000
SCALE IN FEET

HALEY ALDRICH

FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

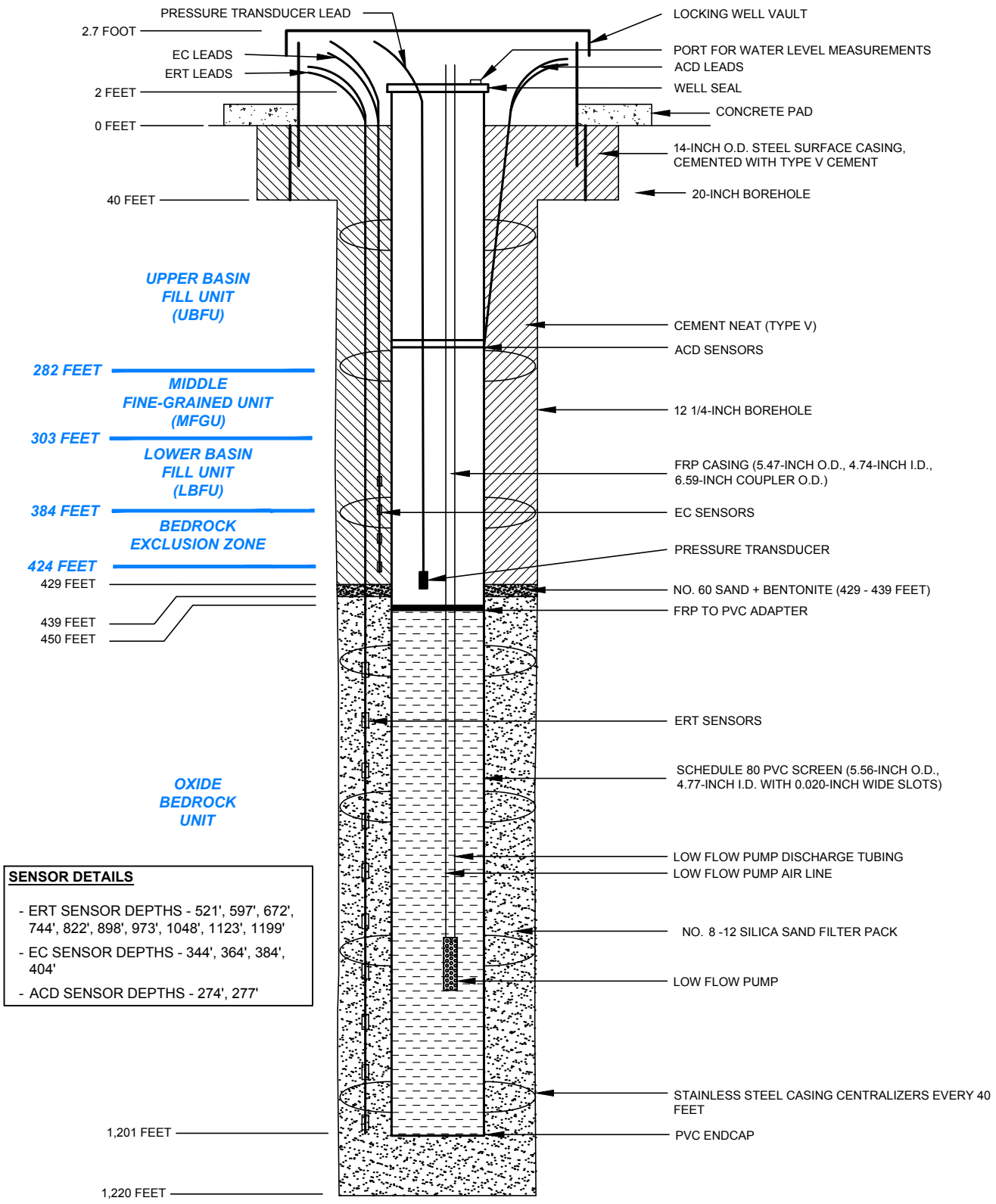
WELL LOCATIONS

FLORENCE COPPER INC.

AUGUST 2018

FIGURE 1

GIS FILE PATH: G:\Projects\Florence Copper\129687 PTF Well Drilling\GIS\Maps\2018_07\129687_010_A001_WELL_LOCATIONS.mxd — USER: dfm — LAST SAVED: 7/17/2018 10:24:09 AM



SENSOR DETAILS

- ERT SENSOR DEPTHS - 521', 597', 672', 744', 822', 898', 973', 1048', 1123', 1199'
- EC SENSOR DEPTHS - 344', 364', 384', 404'
- ACD SENSOR DEPTHS - 274', 277'

NOTES

1. WELL REGISTRATION NO.: 55-227234
2. CADASTRAL LOCATION: D (4-9) 28 CAC
3. MEASURING POINT ELEVATION: 1478.57' AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. ACD = ANNULAR CONDUCTIVITY DEVICE
9. EC = ELECTRICAL CONDUCTIVITY
10. ERT = ELECTRICAL RESISTIVITY TOMOGRAHY

HALEY ALDRICH

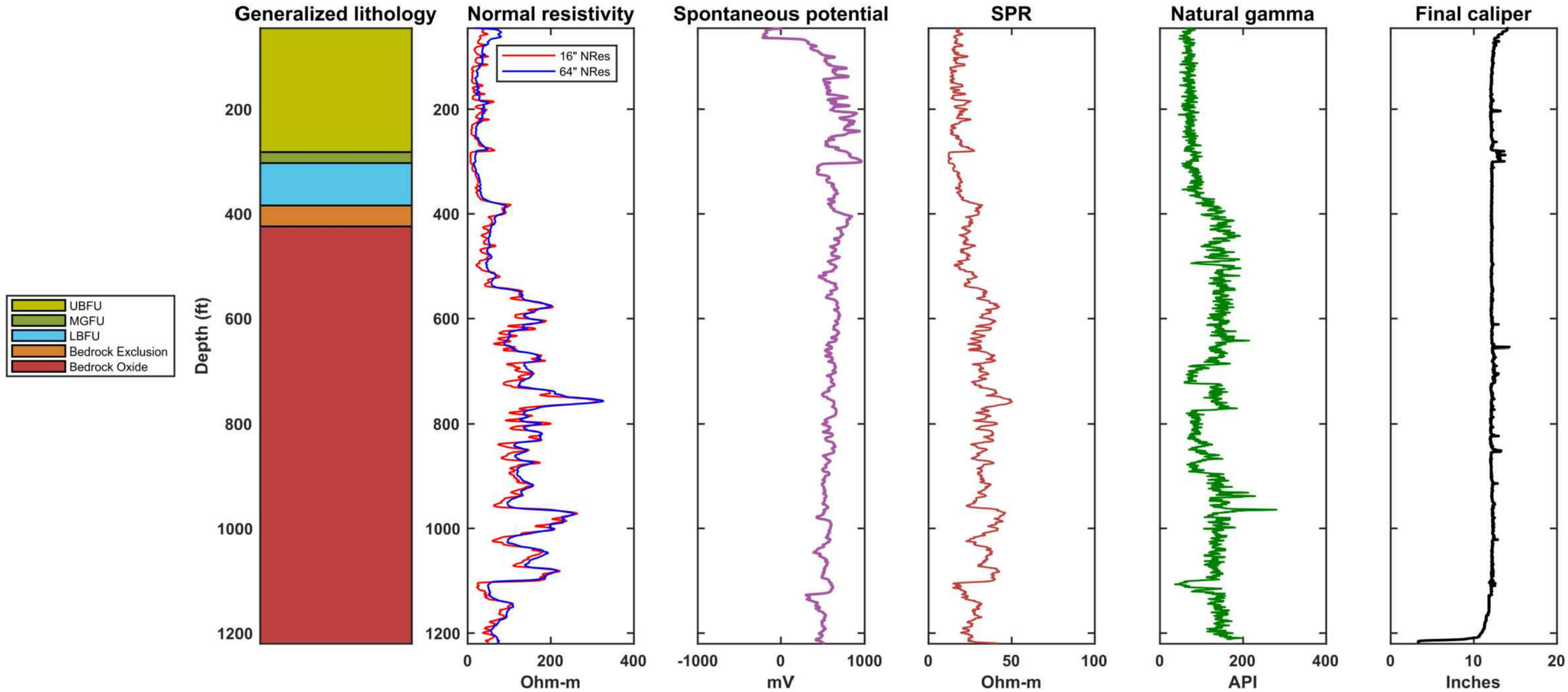
PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

OBSERVATION WELL O-05B AS-BUILT DIAGRAM

FLORENCE COPPER

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 2



HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

OBSERVATION WELL O-05B GEOPHYSICAL DATA AND LITHOLOGIC LOG

FLORENCE COPPER

SCALE: AS SHOWN
SEPTEMBER 2018

FIGURE 3

APPENDIX A

Arizona Department of Water Resources Well Registry Report

Run Date: 04/25/2017

AZ DEPARTMENT OF WATER RESOURCES

WELL REGISTRY REPORT - WELLS55

Location D 4.0 9.0 28 C B D

Well Reg.No 55 - 227234

AMA PINAL AMA

Registered Name AZ STATE LAND DEPT.
1616 W. ADAMS ST.
ATTN: LISA ATKINS
PHOENIX AZ 85007

File Type NEW WELLS (INTENTS OR APPLICATIONS)
Application/Issue Date 04/19/2017

Owner OWNER
Driller No. 823
Driller Name NATIONAL EWP, INC.
Driller Phone 480-558-3500
County PINAL

Intended Capacity GPM 0.00

Well Type ENV - MONITOR
SubBasin ELOY
Watershed UPPER GILA RIVER
Registered Water Uses MONITORING
Registered Well Uses MONITOR
Discharge Method NO DISCHARGE METHOD LISTED
Power NO POWER CODE LISTED

Well Depth	0.00	**Case Diam**	0.00	**Tested Cap**	0.00
Pump Cap.	0.00	**Case Depth**	0.00	**CRT**	
Draw Down	0.00	**Water Level**	0.00	**Log**	
		Acres Irrig	0.00	**Finish**	NO CASING CODE LISTED

Contamination Site: NO - NOT IN ANY REMEDIAL ACTION SITE

Tribe: Not in a tribal zone

Comments Well O-05
AZ State Land Dept. Mineral Lease #11-026500

Current Action

4/25/2017 555 DRILLER & OWNER PACKETS MAILED
Action Comment: TNV

Action History

4/25/2017 550 DRILLING AUTHORITY ISSUED
Action Comment: TNV

4/19/2017 155 NOI RECEIVED FOR A NEW NON-PRODUCTION WELL
Action Comment: TNV

ARIZONA DEPARTMENT OF WATER RESOURCES

1110 W. Washington St. Suite 310
Phoenix, Arizona 85007

THIS AUTHORIZATION SHALL BE IN POSSESSION OF THE DRILLER DURING ALL DRILLING OPERATIONS

WELL REGISTRATION NO: **55-227234** WELL OWNER ID: O-05

AUTHORIZED DRILLER: **NATIONAL EWP, INC.** LICENSE NO: **823**

NOTICE OF INTENTION TO DRILL ENV - MONITOR WELL(S) HAS BEEN FILED WITH THE DEPARTMENT BY:

WELL OWNER: **AZ STATE LAND DEPT. 1616 W. ADAMS ST. ATTN: LISA ATKINS PHOENIX, AZ, 85007**

THE WELL(S) IS/ARE TO BE LOCATED IN THE:

SE 1/4 of the **NW** 1/4 of the **SW** 1/4 Section **28** Township **4.0** **SOUTH** Range **9.0** **EAST**

NO. OF WELLS IN THIS PROJECT: **1**

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE DAY OF **April 19, 2018**

Stella Murillo

GROUNDWATER PERMITTING AND WELLS

THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING.

GREAT SEAL OF THE STATE OF ARIZONA
DITAT DEUS
1912

ARIZONA DEPARTMENT of WATER RESOURCES
1110 W. Washington St. Suite 310
Phoenix, AZ 85007
602-771-8500
azwater.gov

April 25, 2017

AZ STATE LAND DEPT.
1616 W. ADAMS ST.
ATTN: LISA ATKINS
PHOENIX, AZ 85007

DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

Registration No. 55- 227234
File Number: D(4-9) 28 CBD

Dear Well Applicant:

Enclosed is a copy of the Notice of Intention to Drill (NOI) a well which you or your driller recently filed with the Department of Water Resources. This letter is to inform you that the Department has approved the NOI and has mailed, or made available for download, a drilling authorization card to your designated well drilling contractor. The driller may not begin drilling until he/she has received the authorization, and must keep it in their possession at the well site during drilling. Although the issuance of this drill card authorizes you to drill the proposed well under state law, the drilling of the well may be subject to restrictions or regulations imposed by other entities.

Well drilling activities must be completed within one year after the date the NOI was filed with the Department. If drilling is not completed within one year, a new NOI must be filed and authorization from this Department received before proceeding with drilling. If the well cannot be successfully completed as initially intended (dry hole, cave in, lost tools, etc.), the well must be properly abandoned and a Well Abandonment Completion Report must be filed by your driller [as required by A.A.C. R12-15-816(F)].

If you change drillers, you must notify the Department of the new driller's identity on a Request to Change Well Information (form 55-71A). Please ensure that the new driller is licensed by the Department to drill the type of well you require. A new driller may not begin drilling until he/she receives a new drilling authorization card from the Department.

If you find it necessary to change the location of the proposed well(s), you may not proceed with drilling until you file an amended NOI with the Department. An amended drilling authorization card will then be issued to the well drilling contractor, which must be in their possession before drilling begins.

Arizona statute [A.R.S. § 45-600] requires registered well owners to file a Pump Installation Completion Report (form 55-56) with the Department within 30 days after the installation of pumping equipment, if authorized. A blank report is enclosed for your convenience. State statute also requires the driller to file a complete and accurate Well Drillers Report and Well Log (form 55-55) within 30 days after completion of drilling. A blank report form was provided to your driller with the drilling authorization card. You should insist and ensure that all of the required reports are accurately completed and timely filed with the Department.

Please be advised that Arizona statute [A.R.S. § 45-593(C)] requires a registered well owner to notify the Department of a change in ownership of the well and/or information pertaining to the physical characteristics of the well in order to keep this well registration file current and accurate. Any change in well information or a request to change well driller must be filed on a Request to Change Well Information form (form 55-71A) that may be downloaded from the ADWR Internet website at www.azwater.gov.

Sincerely,

Groundwater Permitting and Wells Section

Arizona Department of Water Resources
Groundwater Permitting and Wells Section
P.O. Box 36020 Phoenix, Arizona 85067-6020
(602) 771-8500 • (602) 771-8690
· www.azwater.gov ·

Notice of Intent to Drill, Deepen, or Modify a *Monitor / Piezometer / Environmental* Well

$150 FEE

- Review instructions prior to completing form in black or blue ink.
- You must include with your Notice:
  - $150 check or money order for the filing fee.
  - Well construction diagram, labeling all specifications listed in Section 6 and Section 7.

  Authority for fee: A.R.S. § 45-596 and A.A.C. R12-15-104.

AMA / INA	B	SB
Pinal	PIN	11
RECEIVED DATE	WS	
4/19/2017	08 UGR	
ISSUED DATE	REMEDIAL ACTION SITE	
4/25/2017	600 —	

FILE NUMBER: D(4-9)28CBD
WELL REGISTRATION NUMBER: 55 - 227734

SECTION 1. REGISTRY INFORMATION

To determine the location of well, please refer to the Well Registry Map (https://gisweb.azwater.gov/WellRegistry/Default.aspx) and/or Google Earth (http://www.earthpoint.us/Townships.aspx)

Well Type

CHECK ONE
- [X] Monitor
- [ ] Piezometer
- [ ] Vadose Zone
- [ ] Air Sparging
- [ ] Soil Vapor Extraction
- [ ] Other (*please specify*):

Proposed Action

CHECK ONE
- [X] Drill New Well
- [ ] Deepen
- [ ] Modify

APR 19 2017

WELL REGISTRATION NUMBER *(if Deepening or Modifying)*
55 -

Location of Well

WELL LOCATION ADDRESS (IF ANY)

TOWNSHIP(N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
4.0 S	9.0 E	28	SW ¼	NW ¼	SE ¼

COUNTY ASSESSOR'S PARCEL ID NUMBER

BOOK	MAP	PARCEL
		1001

COUNTY WHERE WELL IS LOCATED: PINAL

SECTION 2. OWNER INFORMATION

Land Owner

FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL: AZ State Land Dept (Mineral Lease # 11-026500)
MAILING ADDRESS: 1616 W Adams St
CITY / STATE / ZIP CODE: Phoenix, AZ 85007
CONTACT PERSON NAME AND TITLE: Lisa Atkins, State Land Commissioner
TELEPHONE NUMBER: (602) 542-4631
FAX:

Well Owner *(check this box if Land Owner and Well Owner are same* [ ] *)*

FULL NAME OF COMPANY, GOVERNMENT AGENCY, OR INDIVIDUAL: Florence Copper, Inc.
MAILING ADDRESS: 1575 W Hunt Hwy
CITY / STATE / ZIP CODE: Florence, AZ 85132
CONTACT PERSON NAME AND TITLE: Ian Ream, Senior Hydrogeologist
TELEPHONE NUMBER: (520) 374-3984
FAX: (520) 374-3999

SECTION 3. DRILLING AUTHORIZATION

Drilling Firm

NAME: National EWP
DWR LICENSE NUMBER: 823
ROC LICENSE CATEGORY: A-4
TELEPHONE NUMBER: (480) 558-3500
FAX: 480-558-3525
EMAIL ADDRESS: jstephens@nationalewp.com

Consultant *(if applicable)*

CONSULTING FIRM: Haley & Aldrich, Inc.
CONTACT PERSON NAME: Mark Nicholls
TELEPHONE NUMBER: 602-760-2423
FAX: 602-760-2448
EMAIL ADDRESS: mnicholls@haleyaldrich.com

SECTION 4.

Questions	Yes	No	Explanation:
1. Are all annular spaces between the casing(s) and the borehole for the placement of grout at least 2 inches?	[X]	[ ]	2-inch annular spaces are special standards required for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
2. Is the screened or perforated interval of casing greater than 100 feet in length?	[X]	[ ]	100-foot maximum screen intervals are a special standard for wells located in and near groundwater contamination sites (such as CERCLA, WQARF, DOD, LUST).
3. Are you requesting a variance to use thermoplastic casing in lieu of steel casing in the surface seal?	[ ]	[X]	The wells must be constructed in a vault. Pursuant to A.A.C. R12-15-801 (27) a "vault" is defined as a tamper-resistant watertight structure used to complete a well below the land surface.
4. Is there another well name or identification number associated with this well? (e.g., MW-1, PZ2, 06-04, etc.)	[X]	[ ]	If yes, please state O-05
5. Have construction plans been coordinated with the Arizona Department of Environmental Quality?	[X]	[ ]	If yes, please state agency contact & phone number David Haag, 602-771-4669
6. For monitor wells, is dedicated pump equipment to be installed?	[ ]	[X]	If yes, please state design pump capacity *(Gallons per Minute)*
7. Is this well a new well located in an Active Management Area **AND** intended to pump water for the purpose of remediating groundwater?	[ ]	[X]	You must also file a supplemental form A.R.S. § 45-454(c) & (f) unless the well is a replacement well and the total number of operable wells on the site is not increasing. *(See instructions)*
8. Will the well registration number be stamped on the vault cover or on the upper part of the casing?	[X]	[ ]	If no, where will the registration number be placed?

Notice of Intent to Drill, Deepen, or Modify a *Monitor / Piezometer / Environmental* Well

WELL REGISTRATION NUMBER 55 - 227234

SECTION 6. WELL CONSTRUCTION DETAILS

Drill Method

CHECK ONE

- ☐ Air Rotary
- ☐ Bored or Augered
- ☐ Cable Tool
- ☐ Dual Rotary
- ☒ Mud Rotary
- ☐ Reverse Circulation
- ☐ Driven
- ☐ Jetted
- ☐ Air Percussion / Odex Tubing
- ☐ Other *(please specify)*:

DATE CONSTRUCTION TO BEGIN: 05/01/2017

Method of Well Development

CHECK ONE

- ☒ Airlift
- ☐ Bail
- ☐ Surge Block
- ☐ Surge Pump
- ☐ Other *(please specify)*:

Method of Sealing at Reduction Points

CHECK ONE

- ☒ None
- ☐ Welded
- ☐ Swedged
- ☐ Packed
- ☐ Other *(please specify)*:

Grout Emplacement Method

CHECK ONE

- ☒ Tremie Pumped *(Recommended)*
- ☐ Gravity
- ☐ Pressure Grout
- ☐ Other *(please specify)*:

Surface or Conductor Casing

CHECK ONE

- ☐ Flush Mount in a vault
- ☒ Extends at least 1' above grade

SECTION 7. PROPOSED WELL CONSTRUCTION PLAN (attach additional page if needed)

Attach a well construction diagram labeling all specifications below.

Per Driller TW

Borehole

DEPTH FROM SURFACE FROM (feet)	DEPTH FROM SURFACE TO (feet)	BOREHOLE DIAMETER (inches)
0	20	18
20	1210	10

Casing

DEPTH FROM SURFACE FROM (feet)	DEPTH FROM SURFACE TO (feet)	OUTER DIAMETER (inches)	MATERIAL TYPE (T) STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	PERFORATION TYPE (T) BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED	IF OTHER TYPE, DESCRIBE	SLOT SIZE IF ANY (inches)
0	20	14	☒	☐	☐		☒	☐	☐	☐	☐		
0	500	5	☒	☐	☐	fiberglass reinforced	☒	☐	☐	☐	☐		
500	1200	5	☐	☒	☐		☐	☐	☐	☐	☒		0.020

Annular Material

DEPTH FROM SURFACE FROM (feet)	DEPTH FROM SURFACE TO (feet)	ANNULAR MATERIAL TYPE (T) NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	BENTONITE GROUT	BENTONITE CHIPS	BENTONITE PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	FILTER PACK SAND	FILTER PACK GRAVEL	FILTER PACK SIZE
0	490	☐	☐	☒	☐	☐	☐	☐		☐	☐	
490	495	☐	☐	☐	☐	☐	☐	☐		☒	☐	No. 30-70
495	1210	☐	☐	☐	☐	☐	☐	☐		☒	☐	No.10-20

IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS:

EXPECTED DEPTH TO WATER *(Feet Below Ground Surface)*: 220

SECTION 8. PERMISSION TO ACCESS

☐ By checking this box, I hereby provide ADWR permission to enter the property for the purpose of taking water level measurements at this well. *(See instructions.)*

SECTION 9. LAND OWNER AND WELL OWNER SIGNATURE

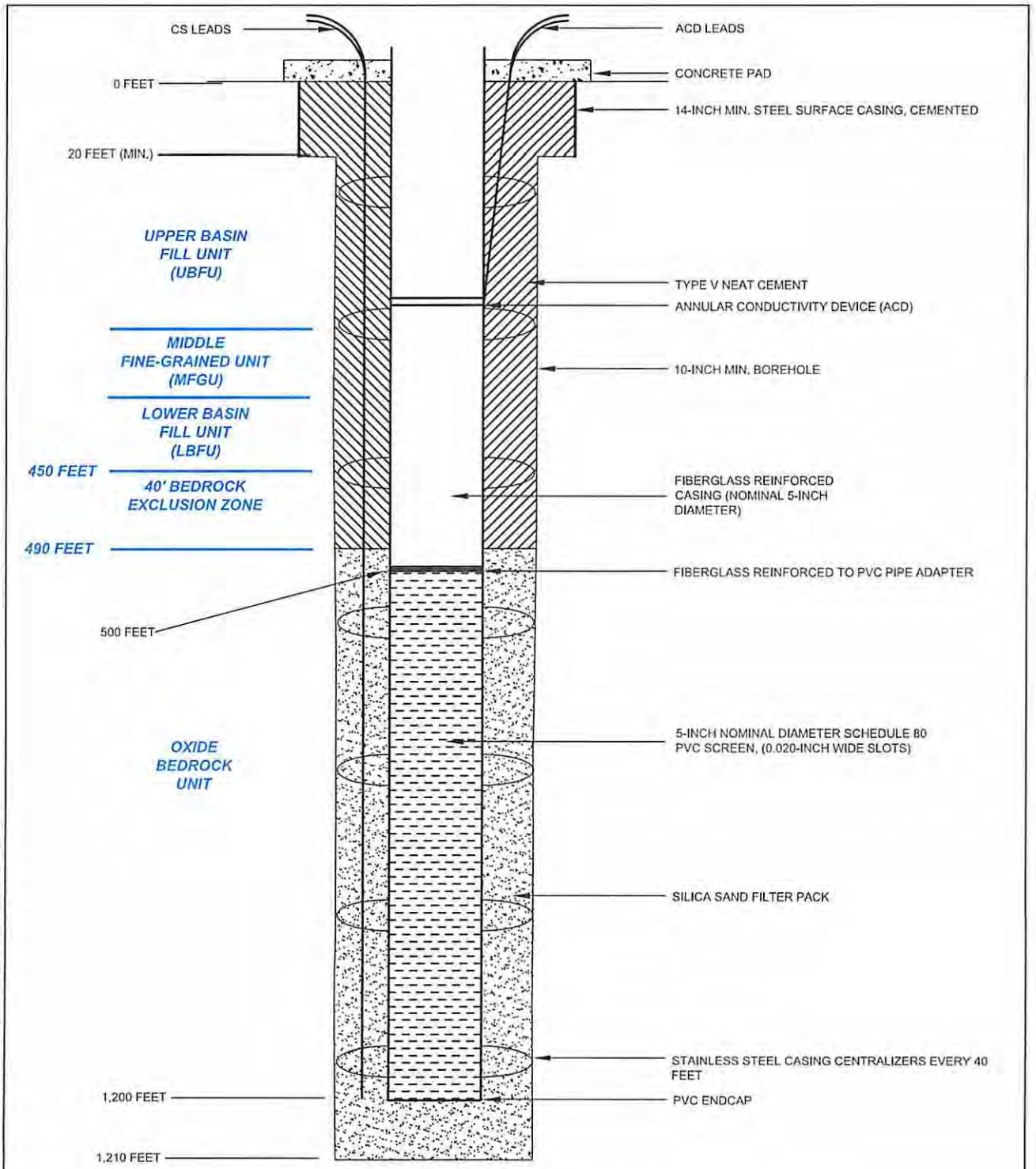
I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and

Land Owner	Well Owner *(if different from Land Owner; See instructions)*
PRINT NAME AND TITLE	PRINT NAME AND TITLE: Ian Ream, Senior Hydrogeologist
SIGNATURE OF LAND OWNER	SIGNATURE OF WELL OWNER
DATE	DATE: 4-17-2017
☐ By checking this box, you agree to allow ADWR to contact you via electronic mail.	☒ By checking this box, you agree to allow ADWR to contact you via electronic mail.
EMAIL ADDRESS	EMAIL ADDRESS: IanReam@florencecopper.com

SECTION 5. Well Construction Diagram

Provide a well construction diagram showing all existing well construction features listed in Section 6 and Section 7.

See attached well diagram.



FLORENCE COPPER, INC.
FLORENCE, ARIZONA

HALEY ALDRICH

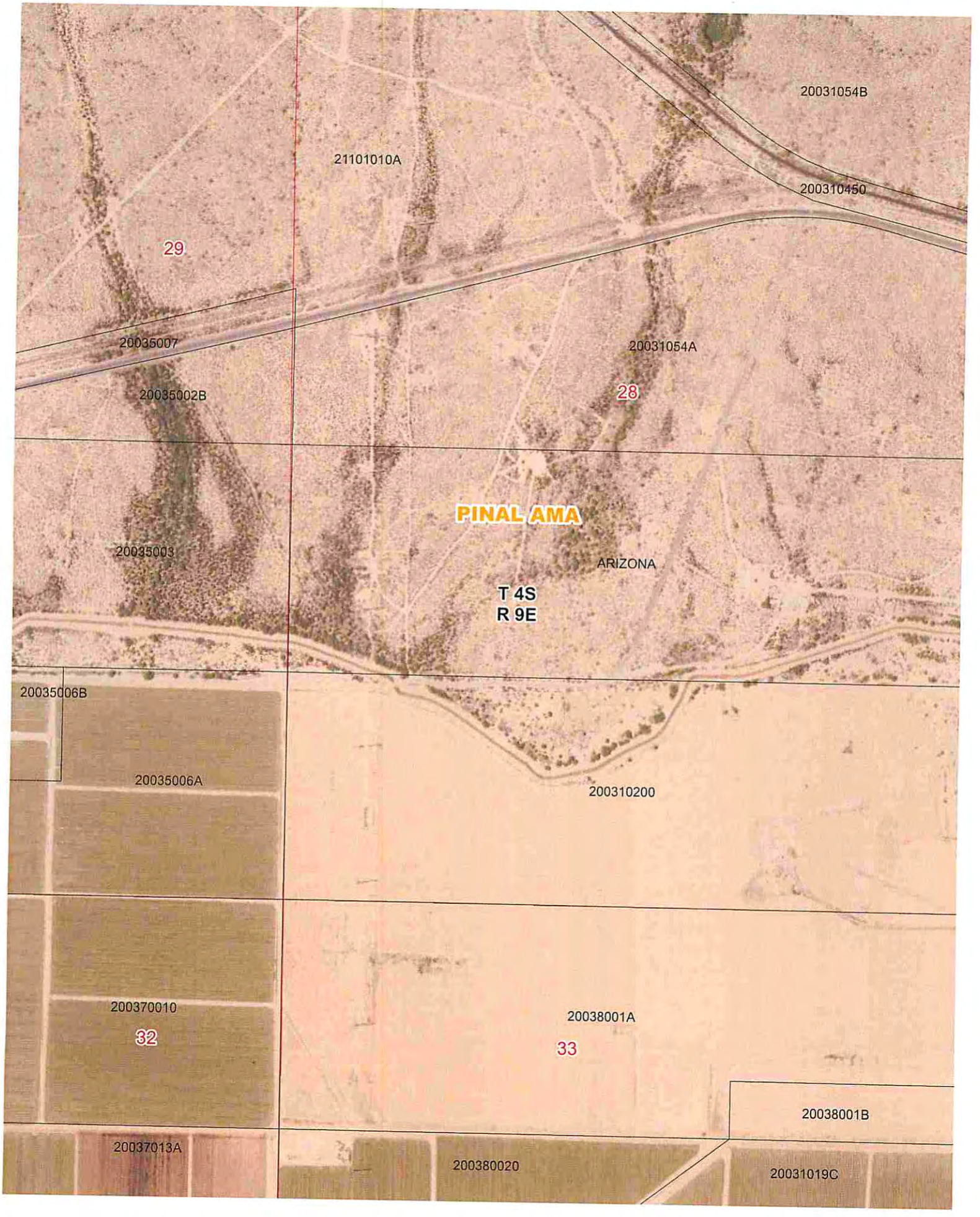
OBSERVATION WELL CONSTRUCTION DIAGRAM

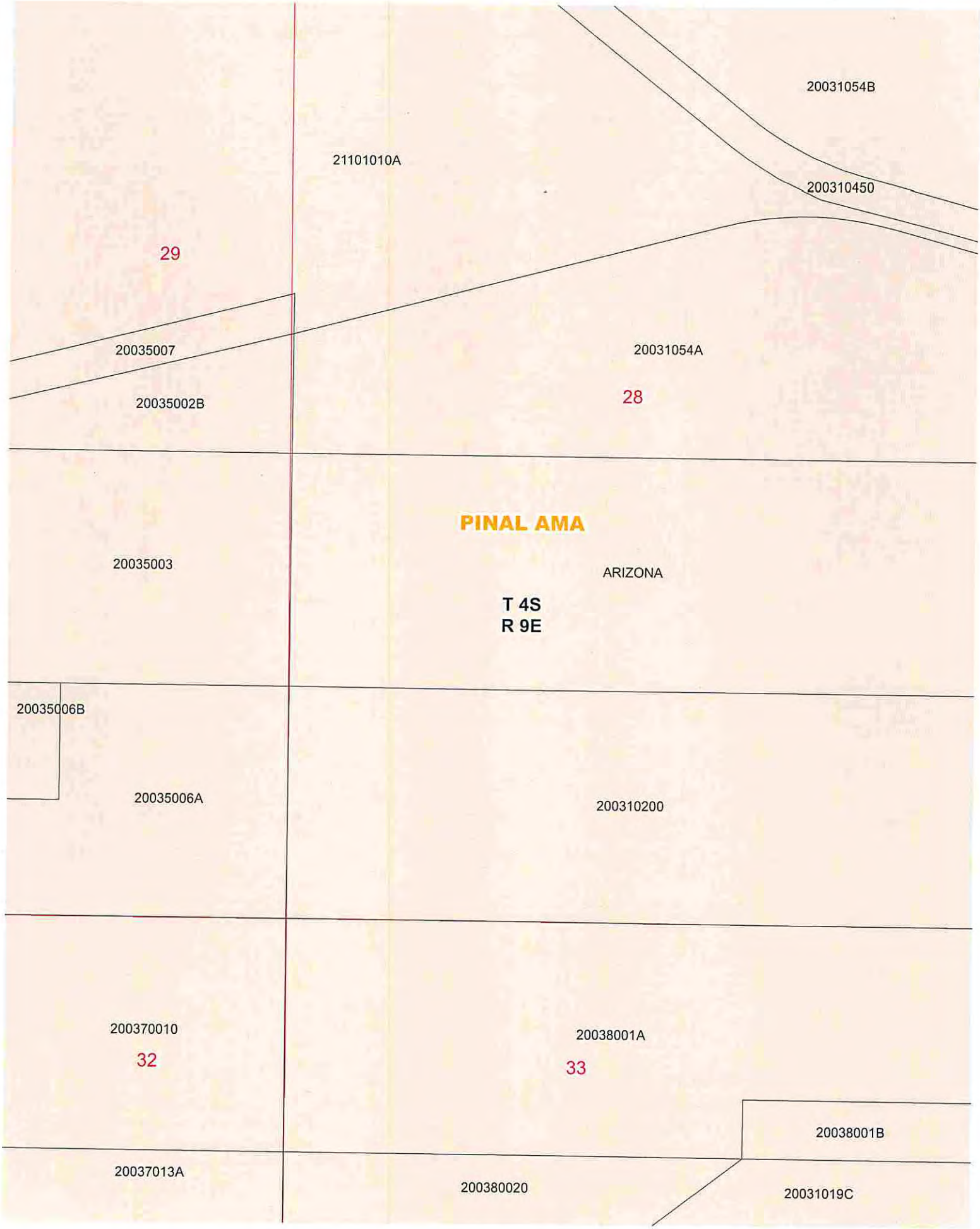
FLORENCE COPPER INC.

SCALE: NOT TO SCALE

FIGURE 1

G:\PROJECTS\CURIS RESOURCES\38706-CURIS FEASIBILITY\DRAWINGS\2014 UIC APP\FIGURES MM-3.DWG


20031054B
21101010A
200310450
29
20035007
20031054A
20035002B
28
PINAL AMA
20035003
ARIZONA
T 4S
R 9E
20035006B
20035006A
200310200
200370010
32
20038001A
33
20038001B
20037013A
200380020
20031019C


20031054B
21101010A
200310450
29
20035007
20031054A
20035002B
28
PINAL AMA
20035003
ARIZONA
T 4S
R 9E
20035006B
20035006A
200310200
200370010
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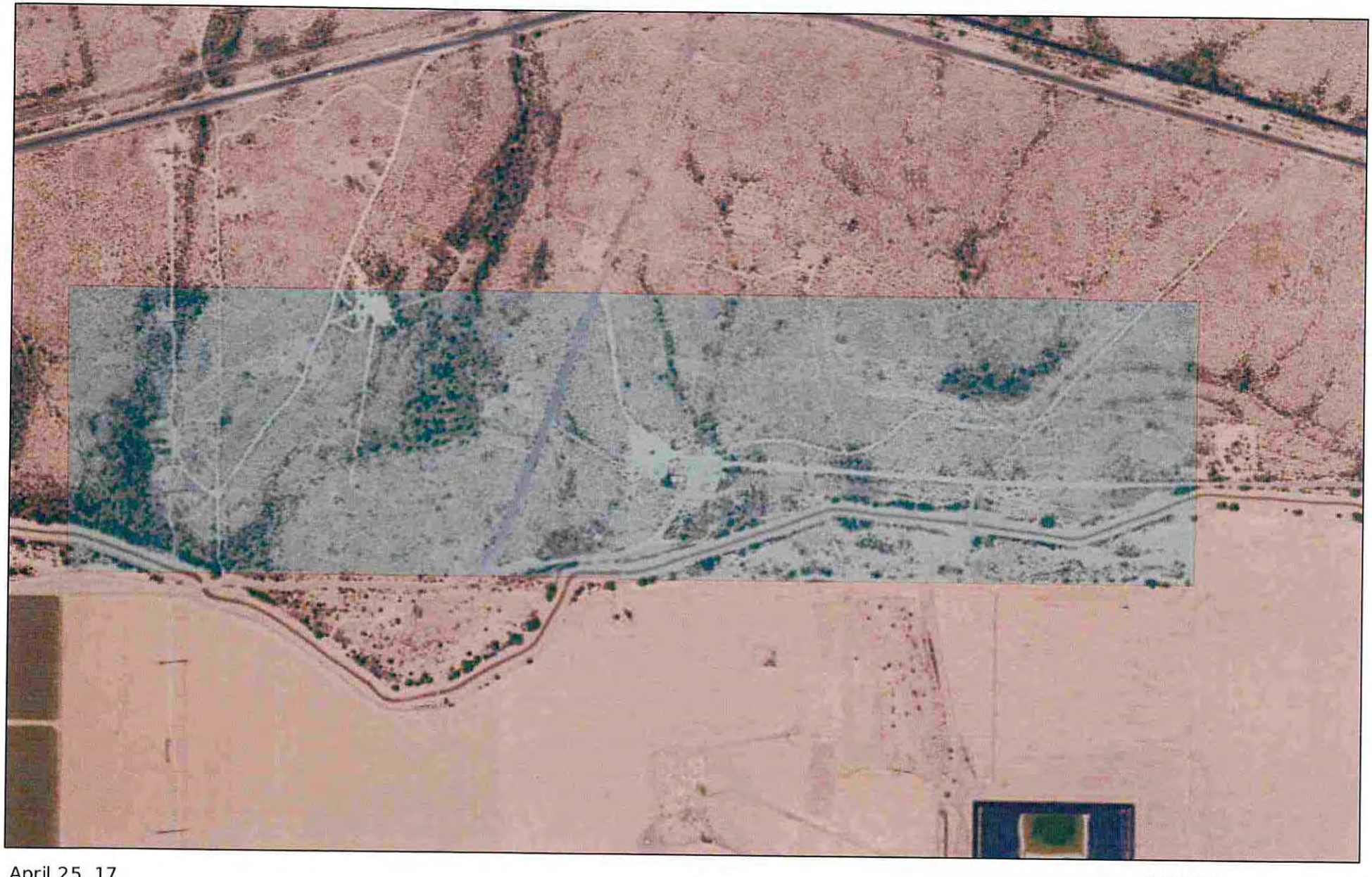
20038001A
33
20038001B
20037013A
200380020
20031019C

Arizona State Land Department



April 25, 17

1:9,028

0 0.075 0.15 0.3 mi

0 0.1 0.2 0.4 km

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

Torren Valdez

From: Justina Speas <jspeas@nationalewp.com>
Sent: Wednesday, April 26, 2017 10:10 AM
To: Torren Valdez
Subject: FW: ADWR Issue
Attachments: Rev_pg3_FRP.pdf

Please see below.

Thank you,

Justina Speas
Office Manager
National EWP, Inc.
1200 W. San Pedro St.
Gilbert, AZ 85233
480-558-3500 PH
480-798-4722 CL
480-558-3525 FX
jspeas@nationalewp.com

From: Candreva, Lauren [mailto:LCandreva@haleyaldrich.com]
Sent: Wednesday, April 26, 2017 10:05 AM
To: Justina Speas <jspeas@nationalewp.com>
Cc: Ian Ream <IanReam@florencecopper.com>
Subject: RE: ADWR Issue

Hi Justina,
Please see the attached pg 3 of the NOI form, this form will be the same for all 7 wells since it does not contain any of the well names or locations. However, it is also the page that has the signatureblock, so please confirm with your ADWR contact that it will not require a signature to complete this file.
Thanks,
Lauren

From: Justina Speas [mailto:jspeas@nationalewp.com]
Sent: Tuesday, April 25, 2017 2:09 PM
To: Candreva, Lauren <LCandreva@haleyaldrich.com>
Cc: Ian Ream <IanReam@florencecopper.com>
Subject: ADWR Issue

Good Afternoon,

I just spoke with Torren Valdez with ADWR, and he informed me of an error with some of the NOI's we just turned in. On O-01 through O-07 the well construction plan shows 0 to 500' as steel, but that is not what the diagram shows.

He said we can just fix the page with the construction plan and email him a copy, and he will put it with the file.

Justina Speas
Office Manager

National EWP, Inc.
1200 W. San Pedro St.
Gilbert, AZ 85233
480-558-3500 PH
480-798-4722 CL
480-558-3525 FX
jspeas@nationalewp.com

Notice of Intent to Drill, Deepen, or Modify a *Monitor / Piezometer / Environmental* Well

WELL REGISTRATION NUMBER
55 -

SECTION 6. WELL CONSTRUCTION DETAILS

Drill Method

CHECK ONE

- ☐ Air Rotary
- ☐ Bored or Augered
- ☐ Cable Tool
- ☐ Dual Rotary
- ☒ Mud Rotary
- ☐ Reverse Circulation
- ☐ Driven
- ☐ Jetted
- ☐ Air Percussion / Odex Tubing
- ☐ Other (*please specify*):

DATE CONSTRUCTION TO BEGIN
05/01/2017

Method of Well Development

CHECK ONE

- ☒ Airlift
- ☐ Bail
- ☐ Surge Block
- ☐ Surge Pump
- ☐ Other (*please specify*):

Grout Emplacement Method

CHECK ONE

- ☒ Tremie Pumped *(Recommended)*
- ☐ Gravity
- ☐ Pressure Grout
- ☐ Other (*please specify*):

Method of Sealing at Reduction Points

CHECK ONE

- ☒ None
- ☐ Welded
- ☐ Swedged
- ☐ Packed
- ☐ Other (*please specify*):

Surface or Conductor Casing

CHECK ONE

- ☐ Flush Mount in a vault
- ☒ Extends at least 1' above grade

SECTION 7. PROPOSED WELL CONSTRUCTION PLAN (attach additional page if needed)

Attach a well construction diagram labeling all specifications below.

Corrected Page TW

Borehole / Casing

Borehole: DEPTH FROM SURFACE FROM (feet)	Borehole: DEPTH FROM SURFACE TO (feet)	Borehole: DIAMETER (inches)	Casing: DEPTH FROM SURFACE FROM (feet)	Casing: DEPTH FROM SURFACE TO (feet)	Casing: OUTER DIAMETER (inches)	MATERIAL TYPE (T): STEEL	MATERIAL TYPE (T): PVC	MATERIAL TYPE (T): ABS	MATERIAL TYPE (T): IF OTHER TYPE, DESCRIBE	PERFORATION TYPE (T): BLANK OR NONE	PERFORATION TYPE (T): WIRE WRAP	PERFORATION TYPE (T): SHUTTER SCREEN	PERFORATION TYPE (T): MILLS KNIFE	PERFORATION TYPE (T): SLOTTED	PERFORATION TYPE (T): IF OTHER TYPE, DESCRIBE	SLOT SIZE IF ANY (inches)
0	20	18	0	20	14	☒	☐	☐		☒	☐	☐	☐	☐		
20	1210	10	0	500	5	☐	☐	☐	FRP	☒	☐	☐	☐	☐		
			500	1200	5	☐	☒	☐		☐	☐	☐	☐	☒		0.020

Annular Material

DEPTH FROM SURFACE FROM (feet)	DEPTH FROM SURFACE TO (feet)	ANNULAR MATERIAL TYPE (T): NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	BENTONITE: GROUT	BENTONITE: CHIPS	BENTONITE: PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	FILTER PACK: SAND	FILTER PACK: GRAVEL	FILTER PACK: SIZE
0	490	☐	☐	☒	☐	☐	☐	☐		☐	☐	
490	495	☐	☐	☐	☐	☐	☐	☐		☒	☐	No. 30-70
495	1210	☐	☐	☐	☐	☐	☐	☐		☒	☐	No.10-20

IF THIS WELL HAS NESTED CASINGS, SPECIFY NUMBER OF CASING STRINGS

EXPECTED DEPTH TO WATER *(Feet Below Ground Surface)*
220

SECTION 8. PERMISSION TO ACCESS

☐ By checking this box, I hereby provide ADWR permission to enter the property for the purpose of taking water level measurements at this well. *(See instructions.)*

SECTION 9. LAND OWNER AND WELL OWNER SIGNATURE

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and

Land Owner	Well Owner *(if different from Land Owner; See instructions)*
PRINT NAME AND TITLE	PRINT NAME AND TITLE Ian Ream, Senior Hydrogeologist
SIGNATURE OF LAND OWNER	SIGNATURE OF WELL OWNER
DATE	DATE
☐ By checking this box, you agree to allow ADWR to contact you via electronic mail.	☒ By checking this box, you agree to allow ADWR to contact you via electronic mail.
EMAIL ADDRESS	EMAIL ADDRESS IanReam@florencecopper.com

Torren Valdez

From: Robert Harding <RHarding@azland.gov>
Sent: Tuesday, April 25, 2017 9:49 AM
To: Torren Valdez
Subject: ASLD (Landowner) Approval for NOI's - Lease #11-26500

FYI

From: Robert Harding
Sent: Wednesday, March 15, 2017 2:31 PM
To: samurillo@azwater.gov
Cc: Fred Breedlove <FBreedlove@azland.gov>; Joe Dixon <jdixon@azland.gov>; Heide Kocsis <HKocsis@azland.gov>
Subject: ASLD (Landowner) Approval for NOI's - Lease #11-26500

Stella,

As you are aware, Florence Copper is in the presence of registering a number of existing wells on State Trust Lease #11-26500 which were originally installed using single registration numbers to permit multiple monitor well installations. A number of these wells will then be permanently abandoned in accordance with Arizona Department of Water Resources (ADWR) requirements. The lessee, Florence Copper, has discussed the specifics of this registration/abandonment process with the Arizona State Land Department (ASLD), and the Department has no objection to the proposed activities.

Please accept this email as documentation of Landowner's approval for the Notice of Intent (NOI) application filings for well registration and abandonment, currently being submitted to ADWR by Florence Copper on ASLD Lease #11-26500, Section 28, T4S, R9E.

Thank you.
Best regards,

Bob Harding
Hydrologist
Water Rights Section
Arizona State land Department
602.542.2672
rharding@azland.gov

Arizona State Land Department

Torren Valdez

From: Ian Ream <IanReam@florencecopper.com>
Sent: Friday, January 13, 2017 9:06 AM
To: Torren Valdez
Subject: Re: Map of monitor well locations

Hi Torren,

The pumps will be QED micro purge. They typically do a liter or two a minute. Very low flow. Looking for discreet interval samples. The flow rate is based on drawdown. The goal is not to draw down the well much more than a half a foot or 1 foot.

Thanks,

Ian Ream
Senior Hydrogeologist
Florence Copper

On Jan 13, 2017, at 8:56 AM, Torren Valdez <tvaldez@azwater.gov> wrote:

> Ian,
>
> Would you happen to know the pump capacity (gpm) for the low-flow pumps that will be installed on those monitoring wells?
>
> Thank you,
>
> **Torren Valdez**
> Water Planning & Permitting Division
> Arizona Department of Water Resources
> 602.771.8614
>
> <image002.jpg>
>
> ---
>
> **From:** Ian Ream [mailto:IanReam@florencecopper.com]
> **Sent:** Thursday, January 12, 2017 11:13 AM
> **To:** Torren Valdez <tvaldez@azwater.gov>
> **Subject:** Map of monitor well locations
>
> Hi Torren,
>
> Here is a map with the well locations.
>
> Please don't hesitate to contact me if you need anything else or have any questions.
>
> Cheers,
>
> Ian

Ian Ream Senior Hydrogeologist

<image003.jpg>

Florence Copper Inc.
1575 W. Hunt Highway Florence AZ USA 85132
C 520-840-9604 T 520-374-3984 F 520-374-3999
E ianream@florencecopper.com Web florencecopper.com

"Notice Regarding Transmission

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NOTICE

A.R.S. § 41-1030(B), (D), (E) and (F) provide as follows:

B. An agency shall not base a licensing decision in whole or in part on a licensing requirement or condition that is not specifically authorized by statute, rule or state tribal gaming compact. A general grant of authority in statute does not constitute a basis for imposing a licensing requirement or condition unless a rule is made pursuant to that general grant of authority that specifically authorizes the requirement or condition.

D. This section may be enforced in a private civil action and relief may be awarded against the state. The court may award reasonable attorney fees, damages and all fees associated with the license application to a party that prevails in an action against the state for a violation of this section.

E. A state employee may not intentionally or knowingly violate this section. A violation of this section is cause for disciplinary action or dismissal pursuant to the agency's adopted personnel policy.

F. This section does not abrogate the immunity provided by section 12-820.01 or 12-820.02.

ARIZONA DEPARTMENT of WATER RESOURCES
1110 W. Washington St. Suite 310
Engineering and Permits Division
Phoenix, AZ 85007
602-771-8500

NOTICE TO WELL DRILLERS

This is a reminder that a valid drill card be present for the drilling of each and every well constructed on a site.* The problem seems to occur during the construction of a well when an unexpected problem occurs. Either the hole collapses, the hole is dry, a drill bit is lost and can't be recovered, or any number of other situations where the driller feels that he needs to move over and start another well. If you encounter this type of scenario, please be aware drillers do not have the authority to start another well without first obtaining drilling authority for the new well. Please note the following statutes and regulations pertaining to well drilling and construction:

ARIZONA REVISED STATUTE (A.R.S.)

A.R.S. § 45-592.A.

A person may construct, replace or deepen a well in this state only pursuant to this article and section 45-834.01. The drilling of a well may not begin until all requirements of this article and section 45-834.01, as applicable, are met.

***

A.R.S. § 594.A.

The director shall adopt rules establishing construction standards for new wells and replacement wells, the deepening and abandonment of existing wells and the capping of open wells.

***

A.R.S. § 600.A

A well driller shall maintain a complete and accurate log of each well drilled.

ARIZONA ADMINISTRATIVE CODE (A.A.C.)

A.A.C. R12-15-803.A.

A person shall not drill or abandon a well, or cause a well to be drilled or abandoned, in a manner which is not in compliance with A.R.S. Title 45, Chapter 2, Article 10, and the rules adopted thereunder.

***

A.A.C. R12-15-810.A.

A well drilling contractor or single well licensee may commence drilling a well only if the well drilling contractor or licensee has possession of a drilling card at the well site issued by the Director in the name of the well drilling contractor or licensee, authorizing the drilling of the specific well in the specific location.

***

A.A.C. R12-15-816.F.

In the course of drilling a new well, the well may be abandoned without first filing a notice of intent to abandon and without an abandonment card.

*** THIS REQUIREMENT DOES NOT PERTAIN TO THE DRILLING OF MINERAL EXPLORATION, GEOTECHNICAL OR HEAT PUMP BOREHOLES**

Transaction Receipt - Success

Arizona Water Resources
Arizona Water Resources
MID:347501639533
1700 W Washington St
Phoenix , AZ 85012
602-771-8454

04/19/2017 11:49AM
Remittance ID
Arizona041917144729704Chr
Transaction ID:
183294013

KELSEY SHERRARD
500 Main Street
WOODLAND, California 95695
United States
Visa - 3420
Approval Code: 050257

Sale
Amount: $1,650.00

---

multiple
N/A
Cash receipts
0
dgchristiana@azwater.gov

Cardmember acknowledges receipt of goods and/or services in the amount of the total shown hereon and agrees to perform the obligations set forth by the cardmember's agreement with the issuer.

Signature _____

click here to continue.

Printed: 4/19/2017 12:26:46 PM

Arizona Department of Water Resources

1110 West Washington Street, Suite 310
Phoenix AZ 85007

Customer:
KELSEY SHERRARD
NATIONAL EWP
500 MAIN STREET
WOODLAND, CA 95695

Receipt #: 17-50968
Office: MAIN OFFICE
Receipt Date: 04/19/2017
Sale Type: Mail
Cashier: WRDGC

Item No.	Function Code	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
8505	122221	4439-6F	MONITOR, PIEZOMETER, AIR SPARGING, SOIL VAPOR EXTR	multiple wells	11	150.00	1,650.00
						RECEIPT TOTAL:	**1,650.00**

Payment type: CREDIT CARD
Amount Paid: $1,650.00
Payment Received Date: 04/19/2017

Authorization 183294013

Notes:

No refund without valid receipt

APPENDIX B

Lithologic Log

HALEY ALDRICH

LITHOLOGIC LOG DRAFT

O-05B

Project	Production Test Facility, Florence, Arizona	File No. 129687
Client	Florence Copper, Inc.	Sheet No. 1 of 15
Contractor	Cascade Drilling LLC	Cadastral Location D (4-9) 28 CBD

Drilling Method	Reverse Rotary	Land Surface Elevation	1476.50	feet, amsl	Start 9 June 2017
Borehole Diameter(s)	20/12.25 in.	Datum	State Plane NAD 83		Finish 19 June 2017
Rig Make & Model	Schramm T685WS	Location	N 746,043	E 847,535	H&A Rep. C. Giusti & C. Price

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
0	1475	SW		**WELL GRADED SAND (0-25 feet)** Primarily fine to coarse sand with ~5% fines and ~5% gravel to 10 mm. Sand is angular to subangular, gravel is rounded. Fines are nonplastic, are red brown, and have a medium reaction to HCL. **UBFU**	**Well Registry ID:** 55-227234 **Surface Completion:** Locking Well Vault & Concrete Pad **Well casing stickup:** 2.3 feet als *COLOR IDENTIFICATION MADE WITH WET SAMPLES USING MUNSELL CHART*
5	1470				
10	1465				
15	1460				
20	1455				
25	1450	GP	25	**POORLY GRADED GRAVEL (25-55 feet)** Primarily gravel to 12 mm with ~ 30% sand and trace fines. Sand is subangular to subrounded, gravel is rounded to subrounded. Fines are nonplastic, red brown to red gray, and there is a medium reaction to HCL. **UBFU**	
30	1445				
35	1440				
40	1435				**Surface Casing:** 14-inch mild steel; 0 - 40 feet **Well Casing:** Nominal 5-inch diameter Fiberglass Reinforced; 0 - 450 feet
45	1430				
50	1425				
55	1420	SW	55	**WELL GRADED SAND (55-120 feet)** Primarily fine to coarse sand with ~5% fines and ~5% gravel to 10 mm. Sand and gravel is subangular to subrounded. Fines are nonplastic, red brown, and have a strong reaction to HCL. **UBFU**	
60	1415				**Unit Intervals:** UBFU: 0 - 282 feet MGFU: 282 - 303 feet LBFU: 303 - 384 feet Oxide Bedrock: 384 - 1220 feet
65	1410				
70	1405				
75					

NOTE: Lithologic descrptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

O-05B

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
75	1400				
80	1395				
85	1390				
90	1385				
95	1380				
100	1375				**Seal:** Type V neat cement 0 - 429 feet Fine sand/bentonite 429 - 439 feet
105	1370				
110	1365				
115	1360				
120	1355	SP	120	**POORLY GRADED SAND (120-150 feet)** Primarily fine sand with ~5% fines and trace gravel to 5 mm. Sand is subangular. Fines are nonplastic, red brown, and have a strong reaction to HCL. **UBFU**	
125	1350				
130	1345				
135	1340				
140	1335				
145	1330				
150	1325	SW	150	**WELL GRADED SAND (150-200 feet)** Primarily fine to coarse sand with ~5% fines and ~5% gravel to 10 mm. Sand and gravel is subangular to subrounded. Fines are nonplastic, red brown, and have a strong reaction to HCL. **UBFU**	
155	1320				
160	1315				

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
165	1310			
170	1305			
175	1300			
180	1295			
185	1290			
190	1285			
195	1280			
200	1275	SW	200	**WELL GRADED SAND with GRAVEL (200-215 feet)** Primarily fine to coarse sand with ~5% fines and ~40% gravel to 13 mm. Sand is subangular, gravel is subrounded to subangular. Fines are nonplastic, red brown, and have a strong reaction to HCL. **UBFU**
205	1270			
210	1265			
215	1260	SC	215	**CLAYEY SAND (215-250 feet)** Primarily fine sand with ~15% fines and ~10% gravel to 12 mm. Sand and gravel is subangular. Fines have medium plasticity, soft consistency, high toughness, + are reddish brown (5YR 4/4), and have a medium reaction to HCL. **UBFU**
220	1255			
225	1250			
230	1245			
235	1240			
240	1235			
245	1230			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
250	1225	SP	250	**POORLY GRADED SAND with GRAVEL (250-282 feet)** Primarily medium to coarse sand with ~5% fines and ~25% gravel to 14 mm. Sand is subangular, gravel is angular. Fines are nonplastic, have soft consistency, are reddish brown (5YR 4/4), and have a medium reaction to HCL. **UBFU**	**ACD Sensor Depths:** 274, 277 feet
255	1220				
260	1215				
265	1210				
270	1205				
275	1200				
280	1195	CH	282	**FAT CLAY with SAND (282-303 feet)** Primarily fines with ~25% sand and trace gravel to 6 mm. Sand is subrounded, gravel is subangular. Fines have high plasticity, soft consistency, high toughness, high dry strength, are reddish brown (5YR 4/3), and have a medium reaction to HCL. **MFGU**	
285	1190				
290	1185				
295	1180				
300	1175	SW	303	**WELL GRADED SAND with GRAVEL (303-384 feet)** Primarily fine to coarse sand with ~5% fines and ~20% gravel to 6 mm. Sand is subangular, gravel is angular. Fines are nonplastic, have soft consistency, are reddish brown (5YR 5/4), and have a strong reaction to HCL. **LBFU**	
305	1170				
310	1165				
315	1160				
320	1155				
325	1150				
330	1145				
335					

HALEY ALDRICH

LITHOLOGIC LOG DRAFT

O-05B

File No. 129687
Sheet No. 5 of 15

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
340	1135				**CS Sensor Depths:** 344, 364, 384, 404 feet
345	1130				
350	1125				
355	1120				
360	1115				
365	1110				
370	1105				
375	1100				
380	1095				
384			384	**QUARTZ MONZONITE (384-500 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%. Cu minerals 420-500	
385	1090				
390	1085				
395	1080				
400	1075				
405	1070				
410	1065				
415	1060				
420	1055				
422			422		

NOTE: Lithologic descrptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

O-05B

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
425	1050			**QUARTZ MONZONITE (384-500 feet)** Continued	
430	1045				
435	1040				
440	1035				**Filter Pack:** 8 - 12 CO Silica Sand; 439 - 1220 feet **Thread Adapter:** Stainless Steel, SCH 80 F480 PVC to API; 450 feet
445	1030				
450	1025				**Well Screen:** Nominal 5-inch diameter, SCH 80 PVC Screen (0.020-inch slots); 450 - 1200 feet **ERT Sensor Depths:** 521, 597, 672, 747, 822, 898, 973, 1048, 1123, 1199 feet
455	1020				
460	1015				
465	1010				
470	1005				
475	1000				
480	995				
485	990				
490	985				
495	980				
500	975		500	**DIABASE (500-525 feet)** Dark gray to black igneous rock. Cu minerals 505-520	
505	970				

NOTE: Lithologic descrptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
510	965			
515	960			
520	955			
525	950		525	**QUARTZ MONZONITE (525-695 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%. Few Cu minerals throughout, abundant 525-580, 610-640.
530	945			
535	940			
540	935			
545	930			
550	925			
555	920			
560	915			
565	910			
570	905			
575	900			
580	895			
585	890			
590	885			
595				

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
	880		596	**QUARTZ MONZONITE (525-695 feet)** Continued
600	875			
605	870			
610	865			
615	860			
620	855			
625	850			
630	845			
635	840			
640	835			
645	830			
650	825			
655	820			
660	815			
665	810			
670	805			
675	800			
680	795			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
685	790			
690	785			
695	780		695	**DIABASE (695-750 feet)** Dark gray to black igneous rock. Cu minerals throughout.
700	775			
705	770			
710	765			
715	760			
720	755			
725	750			
730	745			
735	740			
740	735			
745	730			
750	725		750	**QUARTZ MONZONITE (750-790 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.
755	720			
760	715			
765	710			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
770	705		770	**QUARTZ MONZONITE (750-790 feet)** Continued
775	700			
780	695			
785	690			
790	685		790	**GRANODIORITE (790-900 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%. Cu minerals 855-875
795	680			
800	675			
805	670			
810	665			
815	660			
820	655			
825	650			
830	645			
835	640			
840	635			
845	630			
850	625			
855			856	

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
855	620			**GRANODIORITE (790-900 feet)** Continued
860	615			
865	610			
870	605			
875	600			
880	595			
885	590			
890	585			
895	580			
900	575		900	**QUARTZ MONZONITE (900-1220 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.
905	570			
910	565			
915	560			
920	555			
925	550			
930	545			
935	540			
940	535		943	

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
945	530			**QUARTZ MONZONITE (900-1220 feet)** Continued
950	525			
955	520			
960	515			
965	510			
970	505			
975	500			
980	495			
985	490			
990	485			
995	480			
1000	475			
1005	470			
1010	465			
1015	460			
1020	455			
1025	450			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
1030	445		1030	**QUARTZ MONZONITE (900-1220 feet)** Continued
1035	440			
1040	435			
1045	430			
1050	425			
1055	420			
1060	415			
1065	410			
1070	405			
1075	400			
1080	395			
1085	390			
1090	385			
1095	380			
1100	375			
1105	370			
1110	365			
1115	360		1116	

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
1120	355			**QUARTZ MONZONITE (900-1220 feet)** Continued
1125	350			
1130	345			
1135	340			
1140	335			
1145	330			
1150	325			
1155	320			
1160	315			
1165	310			
1170	305			
1175	300			
1180	295			
1185	290			
1190	285			
1195	280			
1200	275			

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
			1204	**QUARTZ MONZONITE (900-1220 feet)** Continued	
1205	270				
1210	265				
1215	260				
1220			1220		**Total Borehole Depth:** Driller = 1220 feet; Geophysical Logging = 1215 feet

APPENDIX C

Chemical Characteristics of Formation Water

May 23, 2018

Barbara Sylvester
Brown & Caldwell
201 E. Washington Suite 500
Phoenix, AZ 85004

TEL (602) 567-3894
FAX -

Work Order No.: 18D0619
Order Name: Florence Copper

RE: PTF

Dear Barbara Sylvester,

Turner Laboratories, Inc. received 2 sample(s) on 04/25/2018 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Kevin Brim
Project Manager

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Order: Florence Copper

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
18D0619-01	R-09	Ground Water	04/23/2018 1555
18D0619-02	TB	Ground Water	04/25/2018 0000

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Case Narrative

The 8015D analysis was performed by TestAmerica Laboratories, Inc. in Phoenix, AZ.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

D5	Minimum Reporting Limit (MRL) is adjusted due to sample dilution; analyte was non-detect in the sample.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND	Not Detected at or above the PQL
PQL	Practical Quantitation Limit
DF	Dilution Factor
PRL	Project Reporting Limit

Turner Laboratories, Inc.

Date: 05/23/2018

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7 (4.4)									
Calcium	140		4.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Iron	ND		0.30		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Magnesium	27		3.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Potassium	6.8		5.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Sodium	170		5.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
ICP/MS Dissolved Metals-E 200.8 (5.4)									
Aluminum	ND		0.0800	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Antimony	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Arsenic	0.0016		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Barium	0.071		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Beryllium	ND		0.00050	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Cadmium	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Chromium	0.0051		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Cobalt	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Copper	0.011		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Lead	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Manganese	0.0020		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Nickel	0.0033		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Selenium	ND		0.0025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Thallium	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Zinc	ND		0.040		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
CVAA Dissolved Mercury-E 245.1									
Mercury	ND		0.0010		mg/L	1	04/26/2018 0955	04/26/2018 1639	MH
pH-E150.1									
pH (pH Units)	7.8			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
Temperature (°C)	22			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
ICP/MS Total Metals-E200.8 (5.4)									
Uranium	0.016		0.00050		mg/L	1	04/27/2018 1230	04/30/2018 1348	MH

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Anions by Ion Chromatography-E300.0 (2.1)									
Chloride	310		25		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Fluoride	ND		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrate (As N)	8.8		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrite (As N)	ND		0.10		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Sulfate	190		130		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Cyanide-E335.4									
Cyanide	ND		0.10		mg/L	1	04/26/2018 0845	04/30/2018 1545	AP
Alkalinity-SM2320B									
Alkalinity, Bicarbonate (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Carbonate (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Hydroxide (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Phenolphthalein (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Total (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Specific Conductance-SM2510 B									
Conductivity	1700		0.20		µmhos/cm	2	05/09/2018 1315	05/09/2018 1330	AP
Total Dissolved Solids (Residue, Filterable)-SM2540 C									
Total Dissolved Solids (Residue, Filterable)	1000		20		mg/L	1	04/26/2018 0826	05/01/2018 1600	EJ
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: 4-Bromofluorobenzene	*95*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 1943*	*KP*
Surr: Dibromofluoromethane	*101*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 1943*	*KP*
Surr: Toluene-d8	*77*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 1943*	*KP*

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-02

Client Sample ID: TB
Collection Date/Time: 04/25/2018 0000
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 2344*	*KP*
Surr: Dibromofluoromethane	*110*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 2344*	*KP*
Surr: Toluene-d8	*103*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 2344*	*KP*

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804269 - E 245.1										
Blank (1804269-BLK1)				Prepared & Analyzed: 04/26/2018						
Mercury	ND	0.0010	mg/L							
LCS (1804269-BS1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0049	0.0010	mg/L	0.005000		98	85-115			
LCS Dup (1804269-BSD1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0048	0.0010	mg/L	0.005000		95	85-115	2	20	
Matrix Spike (1804269-MS1)		**Source: 18D0394-01**		Prepared & Analyzed: 04/26/2018						
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	97	85-115			
Matrix Spike Dup (1804269-MSD1)		**Source: 18D0394-01**		Prepared & Analyzed: 04/26/2018						
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	96	85-115	1	20	
Batch 1804292 - E200.8 (5.4)										
Blank (1804292-BLK1)				Prepared & Analyzed: 04/30/2018						
Uranium	ND	0.00050	mg/L							
LCS (1804292-BS1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115			
LCS Dup (1804292-BSD1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115	0.2	20	
Matrix Spike (1804292-MS1)		**Source: 18D0614-01**		Prepared & Analyzed: 04/30/2018						
Uranium	0.051	0.00050	mg/L	0.05000	0.0015	99	70-130			
Batch 1805051 - E 200.7 (4.4)										
Blank (1805051-BLK1)				Prepared & Analyzed: 05/04/2018						
Calcium	ND	4.0	mg/L							
Iron	ND	0.30	mg/L							
Magnesium	ND	3.0	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1805051-BS1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		109	85-115			
Iron	1.0	0.30	mg/L	1.000		104	85-115			
Magnesium	10	3.0	mg/L	10.00		105	85-115			
Potassium	10	5.0	mg/L	10.00		105	85-115			
Sodium	10	5.0	mg/L	10.00		105	85-115			
LCS Dup (1805051-BSD1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		110	85-115	1	20	
Iron	1.0	0.30	mg/L	1.000		105	85-115	0.5	20	
Magnesium	10	3.0	mg/L	10.00		105	85-115	0.06	20	
Potassium	10	5.0	mg/L	10.00		105	85-115	0.05	20	
Sodium	11	5.0	mg/L	10.00		109	85-115	4	20	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805051 - E 200.7 (4.4)										
Matrix Spike (1805051-MS1)	**Source: 18D0619-01**			Prepared & Analyzed: 05/04/2018						
Calcium	150	4.0	mg/L	10.00	140	59	70-130			M3
Iron	1.1	0.30	mg/L	1.000	0.028	105	70-130			
Magnesium	38	3.0	mg/L	10.00	27	108	70-130			
Potassium	17	5.0	mg/L	10.00	6.8	105	70-130			
Sodium	170	5.0	mg/L	10.00	170	30	70-130			M3
Matrix Spike (1805051-MS2)	**Source: 18E0021-01**			Prepared & Analyzed: 05/04/2018						
Calcium	64	4.0	mg/L	10.00	54	103	70-130			
Iron	1.0	0.30	mg/L	1.000	0.0060	101	70-130			
Magnesium	21	3.0	mg/L	10.00	11	99	70-130			
Potassium	15	5.0	mg/L	10.00	4.7	104	70-130			
Sodium	99	5.0	mg/L	10.00	90	87	70-130			
Batch 1805069 - E 200.8 (5.4)										
Blank (1805069-BLK1)				Prepared & Analyzed: 05/07/2018						
Aluminum	ND	0.0400	mg/L							
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Barium	ND	0.00050	mg/L							
Beryllium	ND	0.00025	mg/L							
Cadmium	ND	0.00025	mg/L							
Chromium	ND	0.00050	mg/L							
Cobalt	ND	0.00025	mg/L							
Copper	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Manganese	ND	0.00025	mg/L							
Nickel	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Zinc	ND	0.040	mg/L							
LCS (1805069-BS1)				Prepared & Analyzed: 05/07/2018						
Aluminum	0.104	0.0400	mg/L	0.1000		104	85-115			
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115			
Arsenic	0.050	0.00050	mg/L	0.05000		100	85-115			
Barium	0.050	0.00050	mg/L	0.05000		100	85-115			
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115			
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115			
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115			
Cobalt	0.051	0.00025	mg/L	0.05000		101	85-115			
Copper	0.051	0.00050	mg/L	0.05000		103	85-115			
Lead	0.049	0.00050	mg/L	0.05000		98	85-115			
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115			
Nickel	0.051	0.00050	mg/L	0.05000		102	85-115			
Selenium	0.051	0.0025	mg/L	0.05000		103	85-115			
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115			
Zinc	0.10	0.040	mg/L	0.1000		101	85-115			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805069 - E 200.8 (5.4)										
LCS Dup (1805069-BSD1)				Prepared & Analyzed: 05/07/2018						
Aluminum	0.115	0.0400	mg/L	0.1000		115	85-115	10	20	
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115	0.7	20	
Arsenic	0.050	0.00050	mg/L	0.05000		101	85-115	0.8	20	
Barium	0.051	0.00050	mg/L	0.05000		102	85-115	1	20	
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115	0.2	20	
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115	0.2	20	
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115	0.4	20	
Cobalt	0.050	0.00025	mg/L	0.05000		101	85-115	0.5	20	
Copper	0.052	0.00050	mg/L	0.05000		105	85-115	2	20	
Lead	0.049	0.00050	mg/L	0.05000		98	85-115	0.1	20	
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115	0.09	20	
Nickel	0.051	0.00050	mg/L	0.05000		103	85-115	0.8	20	
Selenium	0.052	0.0025	mg/L	0.05000		104	85-115	2	20	
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115	0.06	20	
Zinc	0.10	0.040	mg/L	0.1000		104	85-115	3	20	
Matrix Spike (1805069-MS1)		**Source: 18D0693-01**		Prepared & Analyzed: 05/07/2018						
Aluminum	0.239	0.0400	mg/L	0.1000	0.166	74	70-130			
Antimony	0.045	0.00050	mg/L	0.05000	0.00024	90	70-130			
Arsenic	0.056	0.00050	mg/L	0.05000	0.0035	104	70-130			
Barium	0.16	0.00050	mg/L	0.05000	0.12	94	70-130			
Beryllium	0.045	0.00025	mg/L	0.05000	0.000029	90	70-130			
Cadmium	0.047	0.00025	mg/L	0.05000	ND	94	70-130			
Chromium	0.049	0.00050	mg/L	0.05000	0.00052	98	70-130			
Cobalt	0.048	0.00025	mg/L	0.05000	0.00097	95	70-130			
Copper	0.051	0.00050	mg/L	0.05000	0.0020	98	70-130			
Lead	0.047	0.00050	mg/L	0.05000	0.00016	94	70-130			
Manganese	0.054	0.00025	mg/L	0.05000	0.0075	94	70-130			
Nickel	0.049	0.00050	mg/L	0.05000	0.0018	94	70-130			
Selenium	0.057	0.0025	mg/L	0.05000	ND	114	70-130			
Thallium	0.048	0.00050	mg/L	0.05000	0.000038	96	70-130			
Zinc	0.11	0.040	mg/L	0.1000	ND	109	70-130			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804261 - SM2540 C										
Duplicate (1804261-DUP1)		**Source: 18D0606-01**		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	630	20	mg/L		630			0.3	5	
Duplicate (1804261-DUP2)		**Source: 18D0606-02**		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	610	20	mg/L		620			0.8	5	
Batch 1804268 - E335.4										
Blank (1804268-BLK1)				Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	ND	0.10	mg/L							
LCS (1804268-BS1)				Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000		101	90-110			
LCS Dup (1804268-BSD1)				Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000		101	90-110	0.1	20	
Matrix Spike (1804268-MS1)		**Source: 18D0602-03**		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.1	0.10	mg/L	2.000	ND	103	90-110			
Matrix Spike Dup (1804268-MSD1)		**Source: 18D0602-03**		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000	ND	98	90-110	5	20	
Batch 1804272 - E150.1										
Duplicate (1804272-DUP1)		**Source: 18D0662-02**		Prepared & Analyzed: 04/26/2018						
pH (pH Units)	7.8		-		7.8			0.1	200	H5
Temperature (°C)	21		-		21			2	200	H5
Batch 1805027 - SM2320B										
LCS (1805027-BS1)				Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110			
LCS Dup (1805027-BSD1)				Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110	0	10	
Matrix Spike (1805027-MS1)		**Source: 18D0606-02**		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	96	85-115			
Matrix Spike Dup (1805027-MSD1)		**Source: 18D0606-02**		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	95	85-115	0.5	10	
Batch 1805103 - SM2510 B										
LCS (1805103-BS1)				Prepared & Analyzed: 05/09/2018						
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200			
LCS Dup (1805103-BSD1)				Prepared & Analyzed: 05/09/2018						
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200	0.7	200	
Duplicate (1805103-DUP1)		**Source: 18E0192-01**		Prepared & Analyzed: 05/09/2018						
Conductivity	4.0	0.10	µmhos/cm		4.0			0	10	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805074 - SW8260B										
Blank (1805074-BLK1)				Prepared & Analyzed: 05/07/2018						
Benzene	ND	0.50	ug/L							
Carbon disulfide	ND	2.0	ug/L							
Ethylbenzene	ND	0.50	ug/L							
Toluene	ND	0.50	ug/L							
Xylenes, Total	ND	1.5	ug/L							
Surrogate: 4-Bromofluorobenzene	*25.0*		*ug/L*	*25.00*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*26.9*		*ug/L*	*25.00*		*107*	*70-130*			
Surrogate: Toluene-d8	*25.1*		*ug/L*	*25.00*		*100*	*70-130*			
LCS (1805074-BS1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	29		ug/L	25.00		114	70-130			
Benzene	27		ug/L	25.00		109	70-130			
Chlorobenzene	29		ug/L	25.00		115	70-130			
Toluene	25		ug/L	25.00		101	70-130			
Trichloroethene	26		ug/L	25.00		103	70-130			
Surrogate: 4-Bromofluorobenzene	*24.6*		*ug/L*	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*25.6*		*ug/L*	*25.00*		*102*	*70-130*			
Surrogate: Toluene-d8	*24.8*		*ug/L*	*25.00*		*99*	*70-130*			
LCS Dup (1805074-BSD1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00		110	70-130	4	30	
Benzene	26		ug/L	25.00		104	70-130	5	30	
Chlorobenzene	26		ug/L	25.00		105	70-130	9	30	
Toluene	24		ug/L	25.00		96	70-130	5	30	
Trichloroethene	25		ug/L	25.00		98	70-130	4	30	
Surrogate: 4-Bromofluorobenzene	*24.4*		*ug/L*	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*26.1*		*ug/L*	*25.00*		*104*	*70-130*			
Surrogate: Toluene-d8	*25.1*		*ug/L*	*25.00*		*100*	*70-130*			
Matrix Spike (1805074-MS1)	**Source: 18D0582-02**			Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00	0.070	109	70-130			
Benzene	26		ug/L	25.00	0.020	104	70-130			
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130			
Toluene	27		ug/L	25.00	3.5	95	70-130			
Trichloroethene	24		ug/L	25.00	0.040	97	70-130			
Surrogate: 4-Bromofluorobenzene	*24.4*		*ug/L*	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*26.4*		*ug/L*	*25.00*		*106*	*70-130*			
Surrogate: Toluene-d8	*24.9*		*ug/L*	*25.00*		*100*	*70-130*			
Matrix Spike Dup (1805074-MSD1)	**Source: 18D0582-02**			Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00	0.070	108	70-130	0.8	30	
Benzene	25		ug/L	25.00	0.020	101	70-130	2	30	
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130	0.3	30	
Toluene	27		ug/L	25.00	3.5	95	70-130	0.1	30	
Trichloroethene	24		ug/L	25.00	0.040	95	70-130	2	30	
Surrogate: 4-Bromofluorobenzene	*24.7*		*ug/L*	*25.00*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*26.4*		*ug/L*	*25.00*		*106*	*70-130*			
Surrogate: Toluene-d8	*25.3*		*ug/L*	*25.00*		*101*	*70-130*			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804245 - E300.0 (2.1)										
Blank (1804245-BLK1)				Prepared & Analyzed: 04/25/2018						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1804245-BS1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		92	90-110			
Fluoride	2.0	0.50	mg/L	2.000		101	90-110			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000		95	90-110			
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500		92	90-110			
Sulfate	12	5.0	mg/L	12.50		96	90-110			
LCS Dup (1804245-BSD1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		94	90-110	2	10	
Fluoride	2.0	0.50	mg/L	2.000		101	90-110	0.4	10	
Nitrogen, Nitrate (As N)	4.9	0.50	mg/L	5.000		98	90-110	3	10	
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		95	90-110	3	10	
Sulfate	12	5.0	mg/L	12.50		98	90-110	3	10	
Matrix Spike (1804245-MS1)		**Source: 18D0613-08**		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	89	80-120			
Matrix Spike (1804245-MS2)		**Source: 18D0625-01**		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000	0.46	92	80-120			
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120			
Matrix Spike (1804245-MS3)		**Source: 18D0614-01RE1**		Prepared & Analyzed: 04/26/2018						
Chloride	17		mg/L	12.50	6.4	88	80-120			
Sulfate	28		mg/L	12.50	18	85	80-120			
Matrix Spike Dup (1804245-MSD1)		**Source: 18D0613-08**		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	0.4	10	
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	90	80-120	0.6	10	
Matrix Spike Dup (1804245-MSD2)		**Source: 18D0625-01**		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.1	0.50	mg/L	5.000	0.46	92	80-120	0.2	10	
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	0.4	10	
Matrix Spike Dup (1804245-MSD3)		**Source: 18D0614-01RE1**		Prepared & Analyzed: 04/26/2018						
Chloride	18		mg/L	12.50	6.4	89	80-120	0.6	10	
Sulfate	29		mg/L	12.50	18	86	80-120	0.6	10	

TURNER LABORATORIES INC.

2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 18D0619 DATE 4/23/18 PAGE 1 OF 1

PROJECT NAME Florence Copper #
CONTACT NAME: Barb Sylvester
COMPANY NAME: Brown and Caldwell
ADDRESS: 2 N Central Ave, Suite 1600
CITY Phoenix STATE AZ ZIP CODE 85004
PHONE 602-567-3894 FAX
SAMPLER'S SIGNATURE [signature]

CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	Diss Metals - list (Field Filtered)	Total Uranium (not Filtered)	Inorganics - list	Cyanide (free)	Organics - list	G.Alpha, (RadSafety sub)	Uranium activity if G. Alpha >12	Ra226, 228, Ra-Tot (RadsSafety)	TPH-D (TestAmerica Sub)
R-09	4-23-18	1555		GW	10	X	X	X	X	X	X	X	X	X
8260 TB	4-23-18	1606		GW	1					X				
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										

1. RELINQUISHED BY:
Signature [signature]
Printed Name [handwritten name]
Firm HA
Date/Time 4-23-18 1630

2. RECEIVED BY:
UPS
Signature
Printed Name
Firm
Date/Time

3. RELINQUISHED BY:
UPS
Signature
Printed Name
Firm
Date/Time

4. RECEIVED BY:
Signature [signature]
Printed Name Joseph Catalano
Firm TURNER LABORATORIES INC.
Date/Time 4/23/18 1006

TURNAROUND REQUIREMENTS:
X Standard (approx10 days)*
___ Next day ___ 2 Day ___ 5 Day*
___ Email Preliminary Results To:
* Working Days

*LEGEND
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

REPORT REQUIREMENTS:
X I. Routine Report
___ II. Report (includes DUP,MS,MSD, as required, may be charged as samples)
___ III. Date Validation Report (Includes All Raw Data)
Add 10% to invoice

INVOICE INFORMATION:
Account X Y ___ N
P.O. #
Bill to: Florence Copper

SAMPLE RECEIPT:
Total Containers
Temperature 2.2
☑ Wet Ice ☐ Blue Ice

SPECIAL INSTRUCTIONS/COMMENTS:

Compliance Analysis:	☐ Yes ☐ No	Custody Seals	☐	Preservation Confirmation	☒
ADEQ Forms:	☐ Yes ☐ No	Container Intact	☒	Appropriate Head Space	☒
Mail ADEQ Forms:	☐ Yes ☐ No	COC/Labels Agree	☒	Received Within Hold Time	☒

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

TestAmerica Job ID: 550-101943-1
Client Project/Site: 18D0619

For:
Turner Laboratories, Inc.
2445 North Coyote Drive
Suite 104
Tucson, Arizona 85745

Attn: Kevin Brim

Authorized for release by:
5/16/2018 12:23:25 PM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Definitions/Glossary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
Q9	Insufficient sample received to meet method QC requirements.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-101943-1

Comments
No additional comments.

Receipt
The sample was received on 4/27/2018 10:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8º C.

GC Semi VOA
Method(s) 8015D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD) associated with preparation batch 550-145985 and analytical batch 550-146884. Affected samples have been added a Q9 qualifier. 18D0619-01 (550-101943-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510C.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-101943-1	18D0619-01	Water	04/23/18 15:55	04/27/18 10:50

Detection Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
ORO (C22-C32)	0.21	Q9	0.20		mg/L	1		8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01
Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1
Matrix: Water

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	0.21	Q9	0.20		mg/L		04/30/18 14:16	05/10/18 23:29	1
DRO (C10-C22)	ND	Q9	0.10		mg/L		04/30/18 14:16	05/10/18 23:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*79*		*10 - 150*	*04/30/18 14:16*	*05/10/18 23:29*	*1*

Surrogate Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	OTPH (10-150)							
550-101943-1	18D0619-01	79							
LCS 550-145985/2-A	Lab Control Sample	79							
LCSD 550-145985/3-A	Lab Control Sample Dup	79							
MB 550-145985/1-A	Method Blank	65							

Surrogate Legend

OTPH = o-Terphenyl (Surr)

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 550-145985/1-A
Matrix: Water
Analysis Batch: 146884

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 145985

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	ND		0.20		mg/L		04/30/18 14:15	05/11/18 11:16	1
DRO (C10-C22)	ND		0.10		mg/L		04/30/18 14:15	05/11/18 11:16	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*65*		*10 - 150*	*04/30/18 14:15*	*05/11/18 11:16*	*1*

Lab Sample ID: LCS 550-145985/2-A
Matrix: Water
Analysis Batch: 146884

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 145985

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
ORO (C22-C32)			1.60	1.59		mg/L		99	69 - 107		
DRO (C10-C22)			0.400	0.450		mg/L		113	42 - 133		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl (Surr)	*79*		*10 - 150*

Lab Sample ID: LCSD 550-145985/3-A
Matrix: Water
Analysis Batch: 146884

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 145985

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
ORO (C22-C32)			1.60	1.59		mg/L		100	69 - 107	0	20
DRO (C10-C22)			0.400	0.447		mg/L		112	42 - 133	1	22

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl (Surr)	*79*		*10 - 150*

QC Association Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

GC Semi VOA

Prep Batch: 145985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	3510C	
MB 550-145985/1-A	Method Blank	Total/NA	Water	3510C	
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 146884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	8015D	145985
MB 550-145985/1-A	Method Blank	Total/NA	Water	8015D	145985
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	8015D	145985
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	8015D	145985

Lab Chronicle

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01
Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			145985	04/30/18 14:16	REM	TAL PHX
Total/NA	Analysis	8015D		1	146884	05/10/18 23:29	TC1	TAL PHX

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-18

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method	Method Description	Protocol	Laboratory
8015D	Diesel Range Organics (DRO) (GC)	SW846	TAL PHX
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL PHX

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

SUBCONTRACT ORDER

Turner Laboratories, Inc.

101943

18D0619

SENDING LABORATORY:	RECEIVING LABORATORY:
Turner Laboratories, Inc.	TestAmerica Phoenix
2445 N. Coyote Drive, Ste #104	4625 East Cotton Center Boulevard Suite 189
Tucson, AZ 85745	Phoenix, AZ 85540
Phone: 520.882.5880	Phone :(602) 437-3340
Fax: 520.882.9788	Fax:
Project Manager: Kevin Brim	Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
-01			
Sample ID: 18D0619-01 Drinking Water	**Sampled:04/23/2018 15:55**		
8015D Sub	04/30/2018 15:55		8015D DRO and ORO Paramaters Only
Containers Supplied:			

8015D Sub
o-Terphenyl
C10-C32 (Total)
C22-C32 (Oil Range Organics)
C10-C22 (Diesel Range Organics)
C6-C10 (Gasoline Range Organics)

550-101943 Chain of Custody

3,8°C UPS GR

TA-PHX

Released By	Date	Received By	Date
	4/24/18		4-27-18 1050
Released By	Date	Received By	Date

Login Sample Receipt Checklist

Client: Turner Laboratories, Inc.

Job Number: 550-101943-1

Login Number: 101943
List Number: 1
Creator: Gravlin, Andrea

List Source: TestAmerica Phoenix

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Analysis Completed: May 22, 2018

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
18D0619-01	17.7 ± 0.9	12.9 ± 1.2	4.8 ± 1.5	3.1 ± 0.3	3.1 ± 0.4	6.2 ± 0.5
Date of Analysis	5/2/2018	5/21/2018	5/21/2018	5/4/2018	5/4/2018	5/4/2018

Robert L. Metzger, Ph.D., C.H.P. 5/22/2018
Laboratory License Number AZ0462 Date

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Isotopic Uranium Analysis

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Uranium Analysis Date: May 21, 2018

Sample No.	^{238}U	^{235}U	^{234}U	Total	
18D0619-01	6.0 ± 0.6	0.280 ± 0.004	6.6 ± 0.6	12.9 ± 1.2	Activity (pCi/L)
	17.9 ± 1.7	0.131 ± 0.002	0.00106 ± 0.00010	18.0 ± 1.7	Content (µg/L)
	Comments:				

Robert L. Metzger, Ph.D., C.H.P. 5/22/2018
Date

Laboratory License Number AZ0462

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

April 23, 2018 (Sample Date) 15:55 (Sample Time) (24 hour clock) _____ (Owner/Contact Person)

_____ (Owner/Contact Fax Number) _____ (Owner/Contact Phone Number)

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring — Date Q1 collected: _____

☐ Quarterly — Date Q2 collected: _____

☐ Composite of four quarterly samples — Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result		Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000	5/21/2018	4.8 ± 1.5		
600/00-02		3 pCi/L	Gross Alpha	4002	5/2/2018	17.7 ± 0.9		
7500 - Rn			Radon	4004				
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006	5/21/2018	18.0 ± 1.7	µg/L	
			Uranium 234	4007	5/21/2018	0.00106 ± 0.00010		
			Uranium 235	4008	5/21/2018	0.131 ± 0.002		
			Uranium 238	4009	5/21/2018	17.9 ± 1.7		
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/4/2018	6.2 ± 0.5		X
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/4/2018	3.1 ± 0.3		
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/4/2018	3.1 ± 0.4		

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE60312

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 18D0619-01

Authorized Signature: Robt L. Metzger

Date Public Water System Notified: _____

DWAR 6: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Kevin Brim

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone :(480) 897-9459
Fax: (480) 892-5446
Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 18D0619-01 Drinking Water Sampled:04/23/2018 15:55			
Radiochemistry, Gross Alpha	10/20/2018 15:55		Analyze Uranium and Adjusted Alpha if G. Alpha is > 12
Radiochemistry, Radium 226/228	05/23/2018 15:55		
Containers Supplied:			

H 60312

Released By	Date	Received By	Date
[signature]	4/30/18 16:00	UPS	4/30/18 16:00
Released By	Date	Received By	Date

APPENDIX D

Well Completion Documentation

PIPE TALLY

Project Name.: ECI	Project No.: 129657-025
Well No.: O-05B	Date: 6-17-17
Location:	Pipe Talley for: Casing install
Total Depth:	Geologist: C Price

Type of Connections: ☐ Welded ☐ T+C ☐ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
1	✓	0.55	0.55	PVC Cap					
2	✓ *	20.01	20.56	PVC Screen	1.60/3.72	ERT	10		1198.54
3	✓	19.99	40.55						
4	✓ *	19.99	60.54						
5	✓	19.99	80.53		16.59/19.04	ERT	9		1123.26
6	✓ *	20.06	100.59						
7	✓	19.99	120.58						
8	✓ *	20.00	140.58						
9	✓	20.00	160.58		11.85/14.00	ERT	8		1048.25
10	✓ *	20.00	180.58						
11	✓	20.00	200.58						
12	✓ *	20.00	220.58						
13	✓	20.00	240.58		7.10/9.22	ERT	7		973.00
14	✓ *	20.02	260.60						
15	✓	20.03	280.63						
16	✓ *	20.00	300.63						
17	✓	20.00	320.63		2.40/4.55	ERT	6		897.65
18	✓ *	20.01	340.64						
19	✓	20.00	360.64						
20	✓ *	20.00	380.64		17.65/19.80	ERT	5		822.39
21	✓	20.00	400.64						
22	✓ *	20.03	420.67						
23	✓	20.06	440.73						
24	✓ *	20.03	460.76		12.66/15.03	ERT	4		747.04
25	✓	19.99	480.75						
26	✓ *	20.04	500.79						
27	✓	19.75	520.54						
28	✓ *	20.01	540.55		8.26/10.39	ERT	3		671.87
29	✓	19.99	560.54						
30	✓ *	20.02	580.56	↓					

Notes:

SUMMARY OF TALLY

Total Length tallied:	1202.97
Casing Stick-Up:	2.28
Length of Casing Cut-Off:	0
Bottom of Well:	1200.69
Screened Interval:	1200.14 - 450
Total Screen in Hole:	750.14

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
Conductivity Sensor (CS) single sensor with sing lead 20 ft spacing
Operational Monitoring Sensor (OMS)

* - Centralizer @ bottom of pipe, atleast 3' away from sensors

HALEY ALDRICH

HALEY ALDRICH

PIPE TALLY

Project Name.: FCI	Project No.: 129687-005
Well No.: 10-05B	Date: 6-17-17
Location:	Pipe Talley for: Casing
Total Depth:	Geologist: C Price

Type of Connections: ☐ Welded ☒ T+C ☒ Flush Thread ☐ Other
Fiberglass PVC

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
31	✓	20.05	600.61	PVC Screen					
32	✓	20.02	620.63	↓	3.45/5.61	ERT	2		596.60
33	✓	19.99	640.62						
34	✓	20.01	660.63						
35	✓	20.06	680.69		18.61/-0.69	ERT	1		521.38
36	✓	19.99	700.68						
37	✓	19.99	720.67						
38	✓	20.01	740.68						
39	✓	10.01	750.69	↓					
40	✓	0.50	751.19	PVC/Fiber Adapter					
41	✓	29.08	780.27	Fiberglass					
42	✓	29.10	809.37		16.42	CS	4		404.00
43	✓	29.06	838.43		7.32/27.32	CS	3, 2		384.00/364.00
44	✓	29.05	867.48		18.26	CS	1		344.00
45	✓	29.02	896.50						
46	✓	29.03	925.53		27.19	ACD	1		277.00
47	✓	29.08	954.61		1.16	ACD	2		274.00
48	✓	29.08	983.69						
49	✓	29.12	1012.81						
50	✓	29.18	1041.99						
51	✓	29.19	1071.18						
52	✓	29.04	1100.22						
53	✓	29.11	1129.33						
54	✓	29.24	1158.57						
55	✓	29.12	1187.69						
56		10.14	1197.83						
57		5.14	1202.97						

Notes:

SUMMARY OF TALLY

Total Length tallied:	1202.97
Casing Stick-Up:	2.28
Length of Casing Cut-Off:	
Bottom of Well:	
Screened Interval:	
Total Screen in Hole:	

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
Conductivity Sensor (CS) single sensor with sing lead 20 ft spacing
Operational Monitoring Sensor (OMS)

HALEY ALDRICH

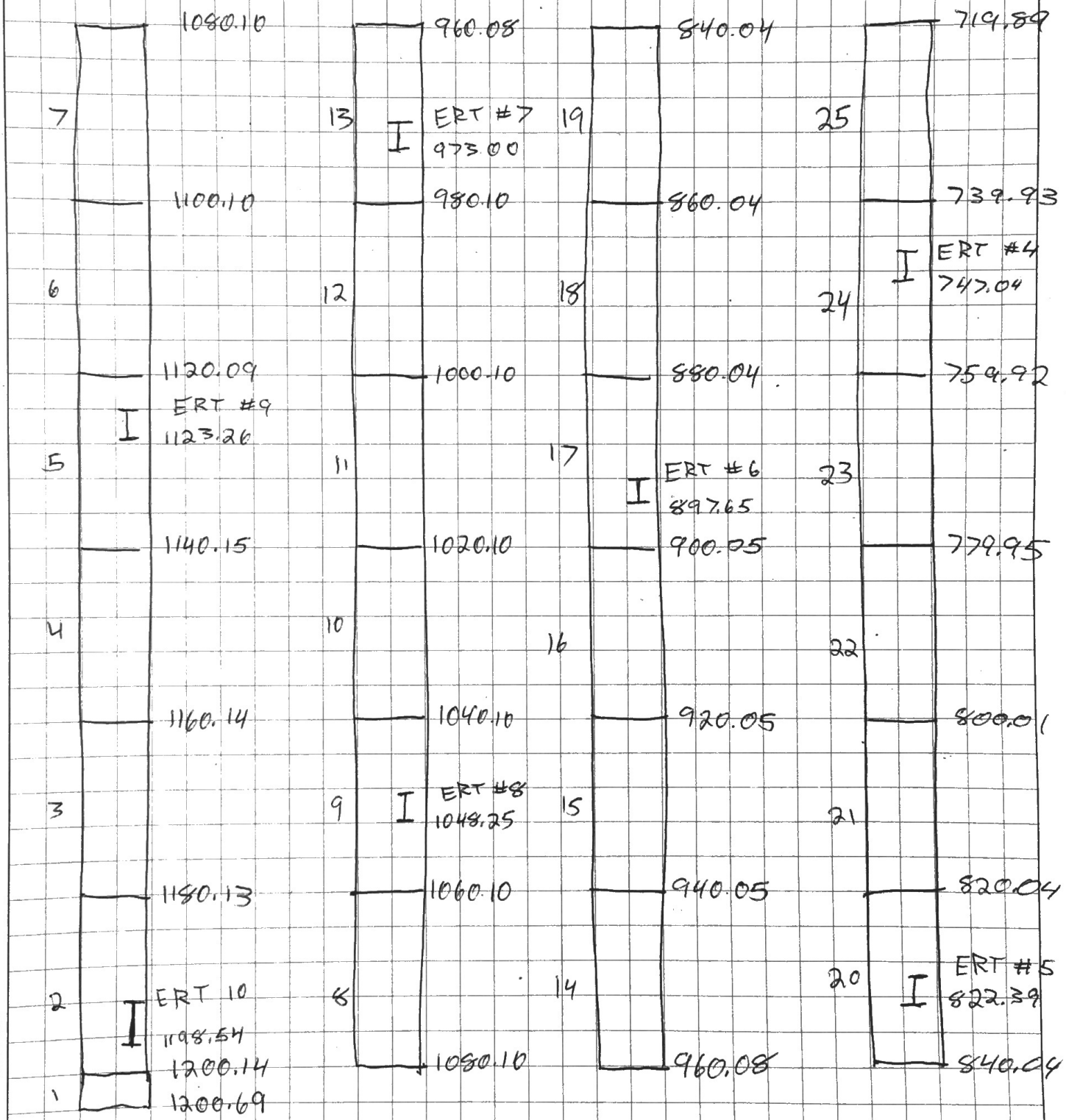
HALEY ALDRICH

HALEY ALDRICH

CALCULATIONS

Client: FCI
Project: O-05B Casing layout.
Subject: Feet below ground level

File No.
Sheet: 1 of 3
Date: 6-17-17
Computed By: C Price
Checked By



MMP_HA4x4Calc 8 Jan 2015

100% Post-consumer waste

HALEY ALDRICH

CALCULATIONS

Client

Project

Subject

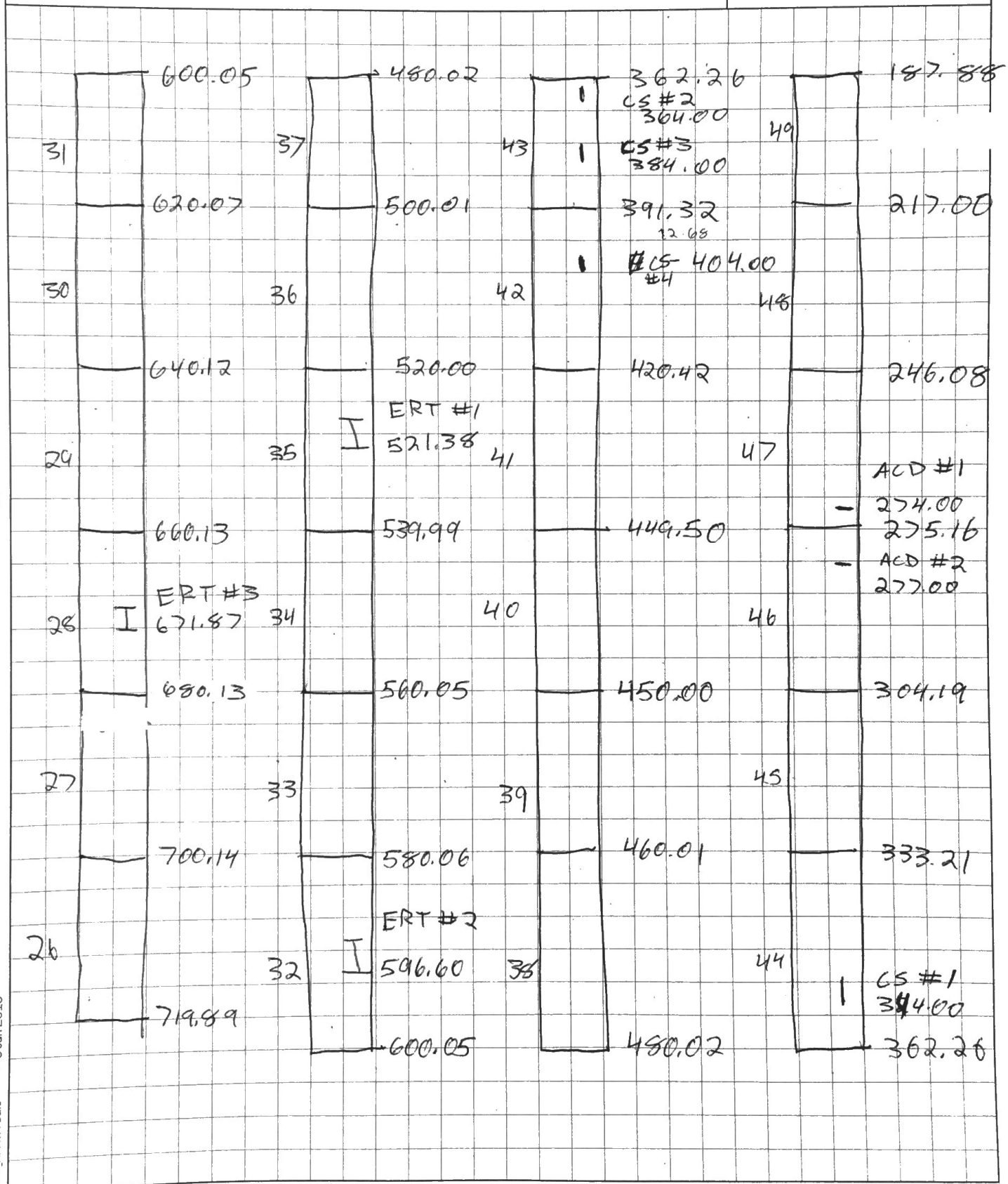
File No.

Sheet 2 of 3

Date

Computed By

Checked By



HALEY ALDRICH

CALCULATIONS

Client

Project

Subject

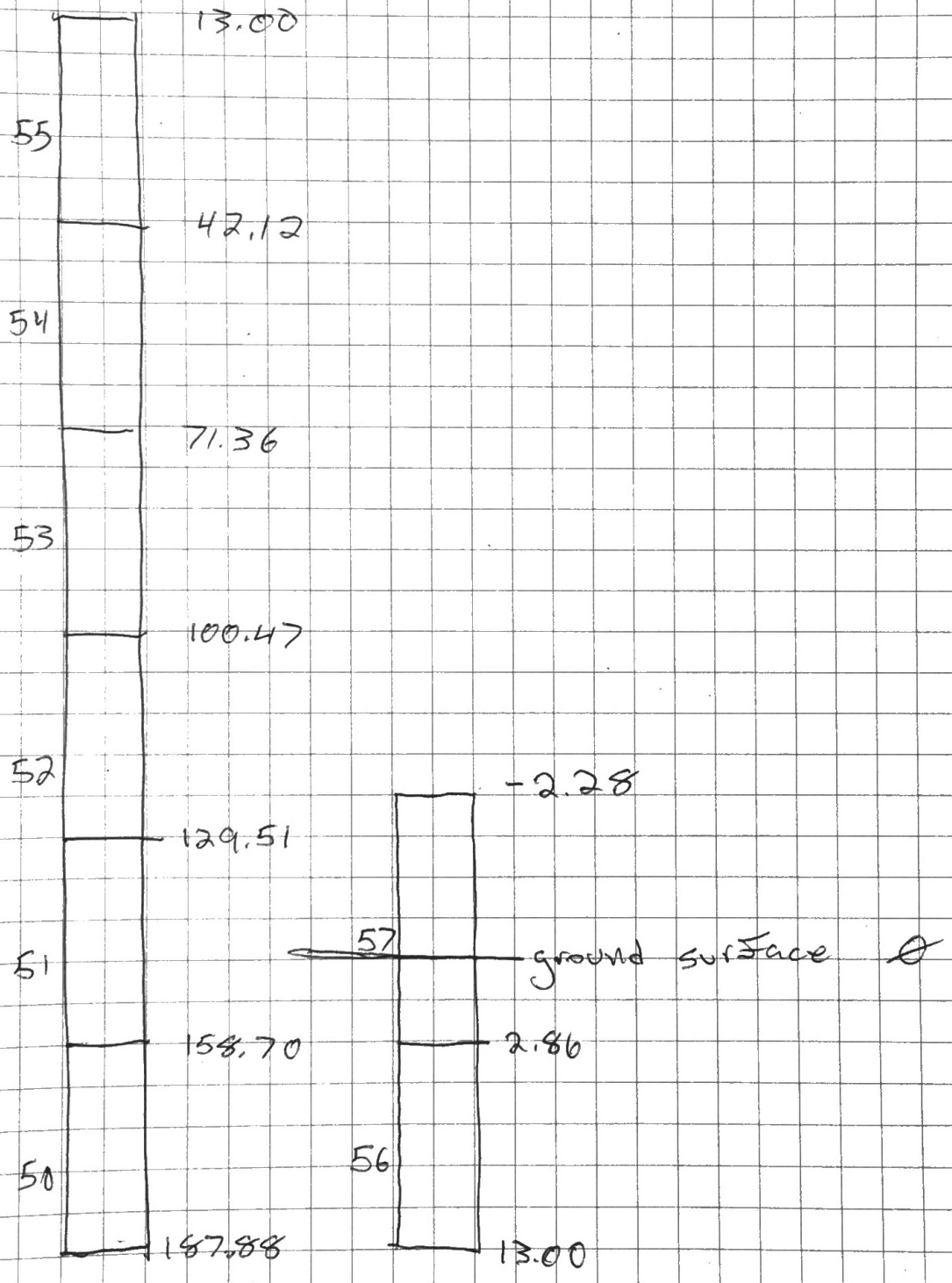
File No.

Sheet 3 of 3

Date

Computed By

Checked By



ESTIMATED ANNULAR MATERIAL RECORD

Project Name: FCI **Project #.:** 129657-005 **Date:** 6-17-17
Well No.: O-05B **Geologist:** C. Price

ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]:	1220	feet	Total Cased Depth:	1203	feet
Borehole Diameter [D]:	12.25	inches	Rat Hole Volume [R=(D^2) 0.005454*L_r]:	13.9	Ft^3
Screen Length [L_s]:	750	feet	Rat Hole Length [L_r]	17	feet
Screen Diameter [d_s]:	5.56	inches	Camera Tube Length [L_{ct}]	—	feet
Casing Length [L_c]	450	feet	Camera Tube Diameter [d_{ct}]	—	inches
Casing Diameter [d_c]	5.31	inches			

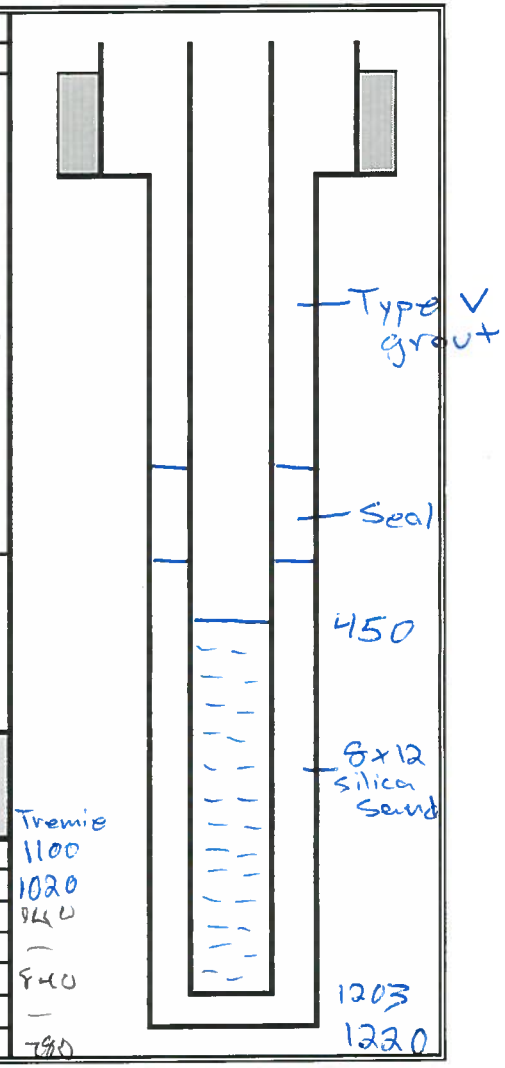
Screen Annular Volume (A_s): (D^2-d_s^2) 0.005454 = 0.65 Ft^3/Lin. Ft
Casing Annular Volume (A_c): (D^2-d_c^2) 0.005454 = 0.66 Ft^3/Lin. Ft
Casing/Cam.Tube Annular Volume (A_{c+ct}): (D^2-d_c^2-d_{ct}^2) 0.005454 = — Ft^3/Lin. Ft

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet
[1] Volume of bag (Ft^3) = bag weight/100
[2] Calculated depth = Previous Calculated depth - (v/A)

Bentonite Sack = 0.69 ft^3
Silica Sand Super Sack = 3000 lbs.

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1] (v) (ft^3)	Total Vol. of Bags (ft^3)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments
1	✓	3000	30	30	1178	—	8x12 Silica Sand
2	✓	3000	30	60	1132	1090	8x12 silica sand
3	✓	3000	30	90	1044	1043	
4	✓	3000	30	120	997	—	
5	✓	3000	30	150	951	953	
6	✓	3000	30	180	907	—	
7	✓	3000	30	210	861	848	



46 lin ft per supersack
390 ft cemented casing
40 ft cemented surface casing

HALEY ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FLT **Project No.:** 129687-005 **Geologist:** S. Hengel
Well No.: O-BS13 **Date:** 10/17/17

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1](v) (ft^3)	Total Vol. of Bags (ft^3)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments
8	↘	3000	30	240	802	800	8x12 silica sand
9	↘	3000	30	270	754	753	
10	↘	3000	30	300	707	709	
11	↘	3000	30	330	~~763~~	659	
12	↘	3000	30	360	613	615	
13	↘	3000	30	390	569	567	
14	↘	3000	30	420	521	515	
15	↘	3000	30	450	469	467	
—	—	—	—	—	—	997	swabbed - 30 min for every 100' - 1200 to
16	↘	3000	30	480	451	445	
—	—	—	—	—	—	449	swabbing - 500'-450', 30 min
17	✓	600	6	486	440	441	9-5gal buckets 8x12 silica sand
18	✓	130	1.3	487.3	430	439	2-5gal buckets 8x12 silica sand
19	✓	—	6.8	494.1	429	431	Seal: 5-5gal pail-plug → 50lb silver sand #60
20	✓	—	2.0	496.1	428	429	Seal: 4-50lb silver sand #60
21	↘	—	216	712.1	96.7	—	8 yrd³ of Type V cement
22	↘	—	~~816~~ 175.5	887.6	-162.2	0	6.5 yrd³ of Type V cement

Notes:

3.3 ft³

0.67 ft³ per 5gall bucket

CEMEX

53675143

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D11/4111							

Customer Code: 3181157
Customer Name: FLORENCE COPPER INC
Customer Job Number: FLORENCE WELL
Order Code / Date: 6480 06/19/17
Project Code: 41097304
Project Name: FLORENCE WELL
Project P.O. Number: NO
Order P.O. Number: NO
Ticket Date: 06/19/17
Delivery Address: 1575 W HUNT HIGHWAY 22SK/CEMEX ONE
Map Page: PIN Map/Row/Column: PINMY201
Delivery Instructions: BATCH RECORDS REQUIRED** HUNT HWY & E/ FELIX RD. MAX
Dispatcher: knash
Ticket Number: 44187382

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:
03:30	11.00	10065262	410523	JENSEN, HOWARD A	FLT BLDNG: OTHER

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
8.00	8.00	16.00	1333049	TYPE II/V SLURRY 21 SK CMT/W LEGACY MATERIAL NO:	YD3		
8.00	8.00	1.00	1336007	SUMMER SET 2	DOS		
1.00	1.00	1.00	1349968	PER DAY DELIVERY	EA		
1.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON_TAXABLE_ARIZONA_			

JUN 19 '17 2:40

☐ Cash ☐ Check ☐ Charge
Check # / Auth Code:
Signature of Driver Receiving Cash:
Cash Received:
Total COD Order Amount to Collect Without Standby Charges:

Comments:

WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED.

SIGNATURE

CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:

SIGNATURE

☐ LOAD WAS TESTED BY: _____

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING**: Product may cause skin and/or eye irritation. **CAUTION**: Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.
AUTHORIZED SIGNATURE
Ⓧ

68UNIVERSAL PREV TRK: LOAD NUM: 1

CUSTOMER

Truck	Driver	User	Disp Ticket Num	Time	Date
5262	410523	operator	44187382	2:34	6/19/17

Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
8.00 CYDS	1333049				D1	97513

Material	Required	Batched	% Moisture	Actual Wat	Trim
CEMENT	15840.00 lb	15800.00 lb			
H20TEMP2	1013.60 gal	1011.62 gal	*	1011.62 gl	
RECOVER	316.80 oz	316.00 oz			100.00 %

Actual Num Batches: 3 Manual 2:34:28

Load 24262 lb Design W/C: 0.534 Water/Cement: 0.534 A Actual 1011.6 gl To Add: 2.0 gl

Slump: 3.00 in

Load Completed Load Time: : ---Tares----------

CEM SCALE	B: 1	ST:	-5	lb	ET:	10	lb	WAT SCALE	B: 1	ST:	-8
WAT SCALE	B: 2	ST:	-4	lb	ET:	-2	lb	CEM SCALE	B: 3	ST:	10

CEMEX

53675144

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D11/4111	310	324	358	401			

Customer Code: 3181157 | Customer Name: FLORENCE COPPER INC | Customer Job Number: FLORENCE WELL | Order Code / Date: 6480 06/19/17

Project Code: 41097304 | Project Name: FLORENCE WELL | Project P.O. Number: NO | Order P.O. Number: NO

Ticket Date: 06/19/17 | Delivery Address: 1575 W HUNT HIGHWAY 22SK/CEMEX ONE | Map Page: Map/Row/Column: PIN PINMY201

Delivery Instructions: BATCH RECORDS REQUIRED** HUNT HWY & E/ FELIX RD. MAX

Dispatcher: knash

Ticket Number: 44187417

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:
03:58	8.00	10065248	410512	DENDY, BRUCE E	FLT BLDNG: OTHER

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
8.00	16.00	16.00	1333049	TYPE II/V SLURRY 21 SK CMT/W LEGACY MATERIAL NO:	YD3		
8.00	16.00	1.00	1336007	SUMMER SET 2	DOS		
1.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON_TAXABLE_ARIZONA_			

JUN 19'17 3:07

☐ Cash ☐ Check ☐ Charge — Check # / Auth Code:

Signature of Driver Receiving Cash:

Cash Received:

Total COD Order Amount to Collect Without Standby Charges:

Comments:

WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED.

_____ SIGNATURE

CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:

_____ SIGNATURE

☐ LOAD WAS TESTED BY: _____

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING**: Product may cause skin and/or eye irritation. **CAUTION**: Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE:

Ⓧ

68UNIVERSAL

PREV TRK: 10065262 JENSEN, HOWARD A LOAD NUM: 2

CUSTOMER

Truck	Driver	User	Disp Ticket Num	Time	Date
5248	410512	operator	44187417	3:00	6/19/17

Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
8.00 CYDS	1333049				D1	97514

Material	Required	Batched	% Moisture	Actual	Wat	Trim
CEMENT	15840.00 lb	15790.00 lb				
H20TEMP2	1013.60 gal	1013.30 gal		1013.30 gl		
RECOVER	316.80 oz	316.00 oz				100.00 %

Actual Num Batches: 3 Manual 3:00:39
Load 24266 lb Design W/C: 0.534 Water/Cement: 0.536 A Actual 1013.3 gl To Add: 0.3 gl
Slump: 8.00 in #

Load Completed Load Time: :

---Tares---

CEM SCALE	B:	1	ST:	10	lb	ET:	5	lb	WAT SCALE	B: 1	ST: 0
WAT SCALE	B:	2	ST:	2	lb	ET:	2	lb	CEM SCALE	B: 3	ST: 10

CEMEX

53675143

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D11/4111							

Customer Code: 3181157
Customer Name: FLORENCE COPPER INC
Customer Job Number: FLORENCE WELL
Order Code / Date: 6480 06/19/17
Project Code: 41097304
Project Name: FLORENCE WELL
Project P.O. Number: NO
Order P.O. Number: NO
Ticket Date: 06/19/17
Delivery Address: 1575 W HUNT HIGHWAY 22SK/CEMEX ONE
Map Page: PIN Map/Row/Column: PINMY201
Delivery Instructions: BATCH RECORDS REQUIRED** HUNT HWY & E/ FELIX RD. MAX
Dispatcher: knash
Ticket Number: 44187382

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:
03:30	11.00	10065262	410523	JENSEN, HOWARD A	FLT BLDNG: OTHER

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
8.00	8.00	16.00	1333049	TYPE II/V SLURRY 21 SK CMT/W LEGACY MATERIAL NO:	YD3		
8.00	8.00	1.00	1336007	SUMMER SET 2	DOS		
1.00	1.00	1.00	1349968	PER DAY DELIVERY	EA		
1.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON_TAXABLE_ARIZONA_			

JUN 19 '17 2:40

☐ Cash ☐ Check ☐ Charge
Check # / Auth Code:
Signature of Driver Receiving Cash:
Cash Received:
Total COD Order Amount to Collect Without Standby Charges:

Comments:

WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED.

SIGNATURE

CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:

SIGNATURE

☐ LOAD WAS TESTED BY: _____

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING**: Product may cause skin and/or eye irritation. **CAUTION**: Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.
AUTHORIZED SIGNATURE
Ⓧ

68UNIVERSAL PREV TRK: LOAD NUM: 1

CUSTOMER

Truck	Driver	User	Disp Ticket Num	Time	Date
5262	410523	operator	44187382	2:34	6/19/17

Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
8.00 CYDS	1333049				D1	97513

Material	Required	Batched	% Moisture	Actual Wat	Trim
CEMENT	15840.00 lb	15800.00 lb			
H20TEMP2	1013.60 gal	1011.62 gal	*	1011.62 gl	
RECOVER	316.80 oz	316.00 oz			100.00 %

Actual Num Batches: 3 Manual 2:34:28

Load 24262 lb Design W/C: 0.534 Water/Cement: 0.534 A Actual 1011.6 gl To Add: 2.0 gl

Slump: 3.00 in

Load Completed Load Time: : ---Tares----------

CEM SCALE	B: 1	ST:	-5	lb	ET:	10	lb	WAT SCALE	B: 1	ST:	-8
WAT SCALE	B: 2	ST:	-4	lb	ET:	-2	lb	CEM SCALE	B: 3	ST:	10

CEMEX

53675144

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D11/4111	310	324	358	401			

Customer Code: 3181157 | Customer Name: FLORENCE COPPER INC | Customer Job Number: FLORENCE WELL | Order Code / Date: 6480 06/19/17

Project Code: 41097304 | Project Name: FLORENCE WELL | Project P.O. Number: NO | Order P.O. Number: NO

Ticket Date: 06/19/17 | Delivery Address: 1575 W HUNT HIGHWAY 22SK/CEMEX ONE | Map Page: Map/Row/Column: PIN PINMY201

Delivery Instructions: BATCH RECORDS REQUIRED** HUNT HWY & E/ FELIX RD. MAX

Dispatcher: knash

Ticket Number: 44187417

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:
03:58	8.00	10065248	410512	DENDY, BRUCE E	FLT BLDNG: OTHER

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
8.00	16.00	16.00	1333049	TYPE II/V SLURRY 21 SK CMT/W LEGACY MATERIAL NO:	YD3		
8.00	16.00	1.00	1336007	SUMMER SET 2	DOS		
1.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON_TAXABLE_ARIZONA_			

JUN 19'17 3:07

☐ Cash ☐ Check ☐ Charge — Check # / Auth Code:

Signature of Driver Receiving Cash:

Cash Received:

Total COD Order Amount to Collect Without Standby Charges:

Comments:

WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED.

_____ SIGNATURE

CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:

_____ SIGNATURE

☐ LOAD WAS TESTED BY: _____

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AUTHORIZED SIGNATURE:

Ⓧ

68UNIVERSAL

PREV TRK: 10065262 JENSEN, HOWARD A LOAD NUM: 2

CUSTOMER

Truck	Driver	User	Disp Ticket Num	Time	Date
5248	410512	operator	44187417	3:00	6/19/17

Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
8.00 CYDS	1333049				D1	97514

Material	Required	Batched	% Moisture	Actual	Wat	Trim
CEMENT	15840.00 lb	15790.00 lb				
H20TEMP2	1013.60 gal	1013.30 gal		1013.30 gl		
RECOVER	316.80 oz	316.00 oz				100.00 %

Actual Num Batches: 3 Manual 3:00:39
Load 24266 lb Design W/C: 0.534 Water/Cement: 0.536 A Actual 1013.3 gl To Add: 0.3 gl
Slump: 8.00 in #

Load Completed Load Time: :

---Tares---

CEM SCALE	B:	1	ST:	10	lb	ET:	5	lb	WAT SCALE	B: 1	ST: 0
WAT SCALE	B:	2	ST:	2	lb	ET:	2	lb	CEM SCALE	B: 3	ST: 10

APPENDIX E

Geophysical Logs

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	O-05B
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: E-LOG

MORE: NAT. GAMMA

LOCATION

SEC TWP RGE

OTHER SERVICES
TEMPERATURE
FLUID RESISTIVITY
SONIC
DEVIATION

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	6-16-17	TYPE FLUID IN HOLE	MUD
RUN No	1 & 2	MUD WEIGHT	N/A
TYPE LOG	E-LOG - NAT. GAMMA	VISCOSITY	N/A
DEPTH-DRILLER	1220 FT.	LEVEL	FULL
DEPTH-LOGGER	1215 FT.	MAX. REC. TEMP.	34.44 DEG. C
BTM LOGGED INTERVAL	1215 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	NATIONAL	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	A. OLSON / E. TURNER	TOOL STRING/SN	GEOVISTA E-LOG SN 4790
WITNESSED BY	LAUREN - H & A	LOG TIME:ON SITE/OFF SITE	7:00 P.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	40 FT.
2	12 1/4 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

.

Tool Summary:

Date	6-16-17	**Date**	6-16-17	**Date**	6-16-17		
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	MSI 60MM SONIC		
Tool SN	4183	**Tool SN**	4790	**Tool SN**	5001		
From	SURFACE	**From**	SURFACE	**From**	SURFACE		
To	1215 FT.	**To**	1215 FT.	**To**	1215 FT.		
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON		
Truck No	900	**Truck No**	900	**Truck No**	900		
Operation Check	6-15-17	**Operation Check**	6-15-17	**Operation Check**	6-15-17		
Calibration Check	6-15-17	**Calibration Check**	6-15-17	**Calibration Check**	N/A		
Time Logged	7:40 P.M.	**Time Logged**	8:40 P.M.	**Time Logged**	9:20 P.M.		
Date	6-16-17	**Date**		**Date**			
Run No.	4	**Run No.**	5	**Run No.**	6		
Tool Model	MSI DEVIATION	**Tool Model**		**Tool Model**			
Tool SN	6002	**Tool SN**		**Tool SN**			
From	SURFACE	**From**		**From**			
To	1215 FT.	**To**		**To**			
Recorded By	A. OLSON	**Recorded By**		**Recorded By**			
Truck No	900	**Truck No**		**Truck No**			
Operation Check	6-15-17	**Operation Check**		**Operation Check**			
Calibration Check	N/A	**Calibration Check**		**Calibration Check**			
Time Logged	10:30 P.M.	**Time Logged**		**Time Logged**			

Additional Comments:

Caliper Arms Used: 15 IN. **Calibration Points:** 8 IN. & 23 IN.

E-Log Calibration Range: 1-1000 OHM-M **Calibration Points:** 1 & 1000 OHM-M

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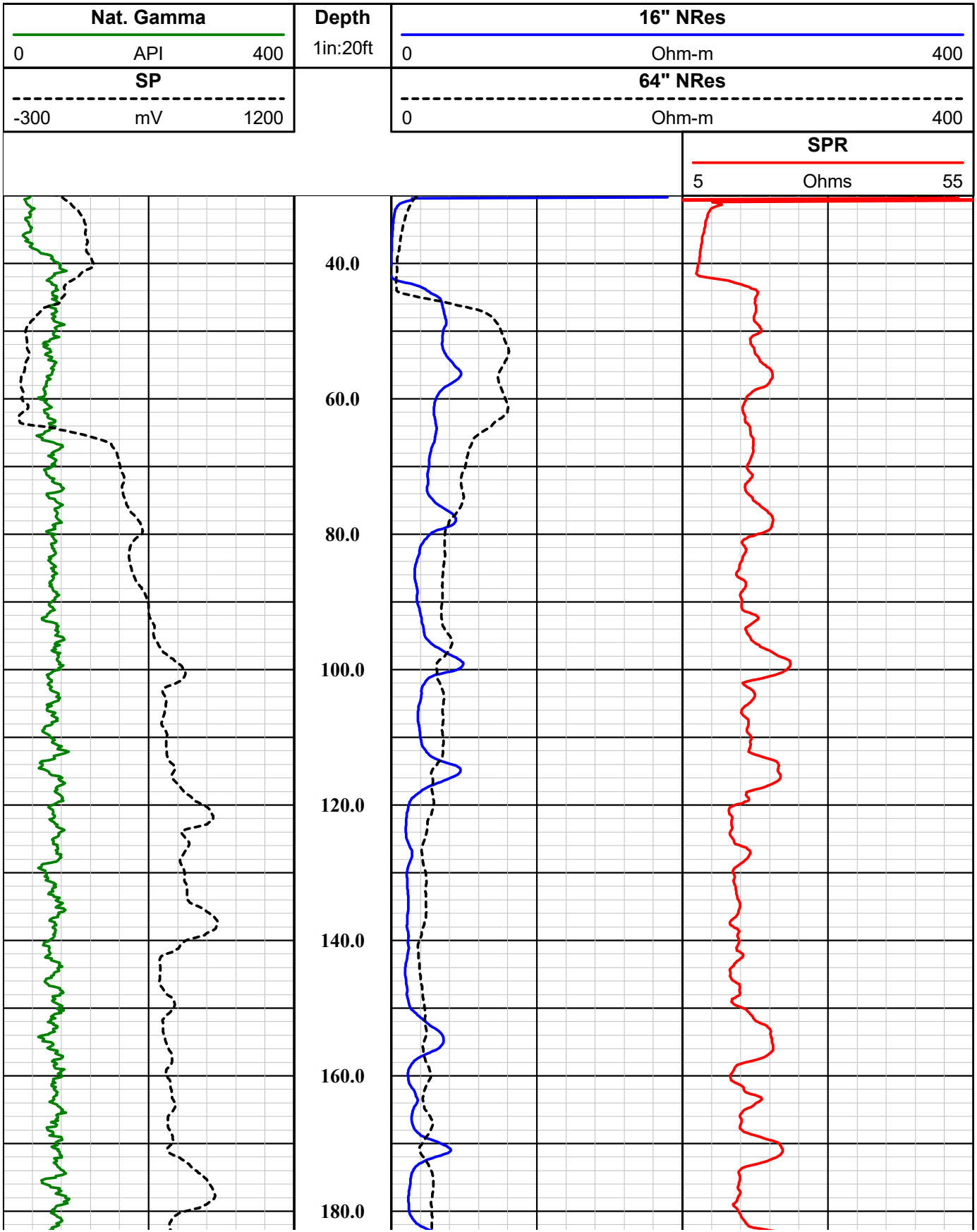

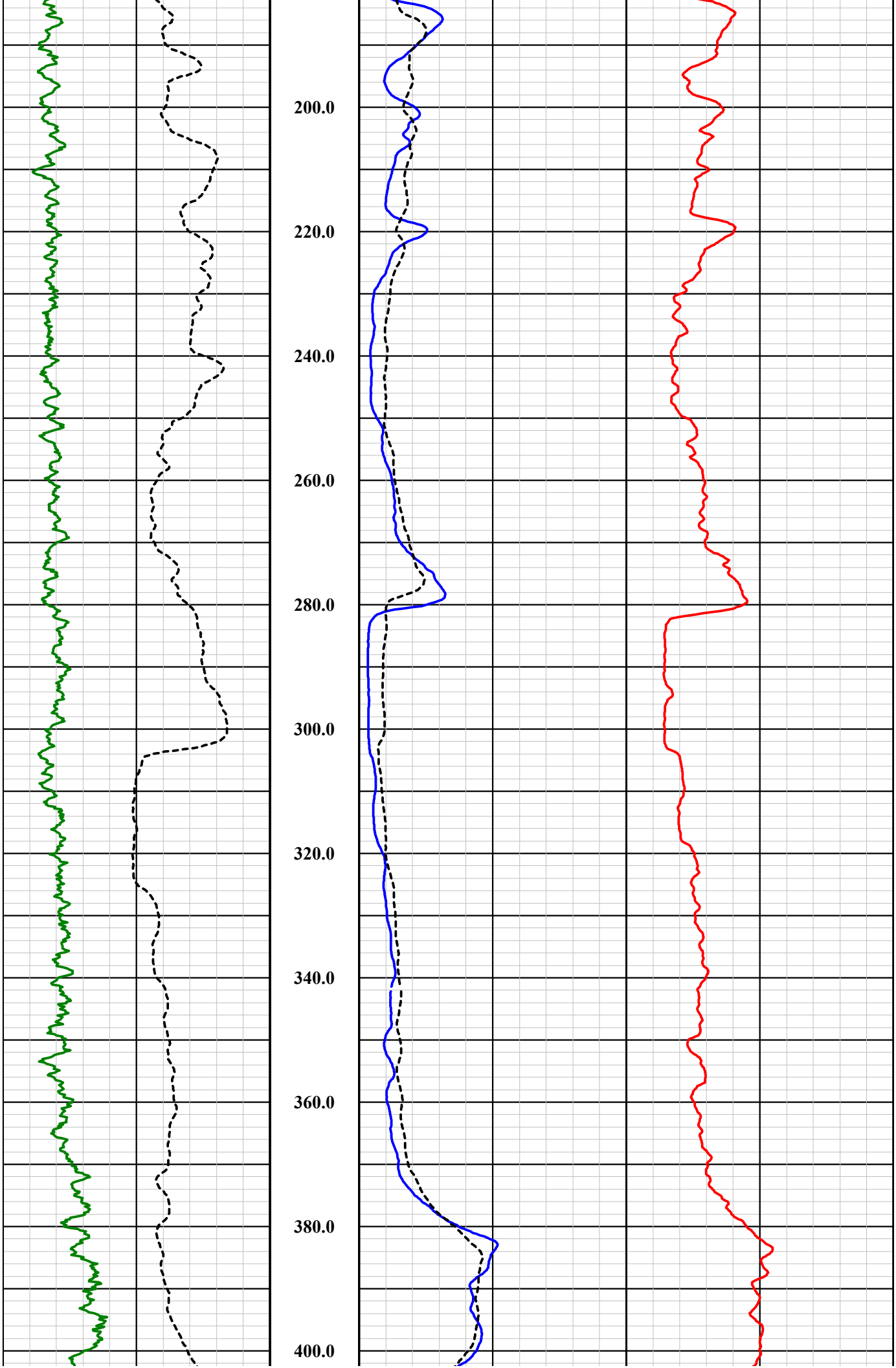
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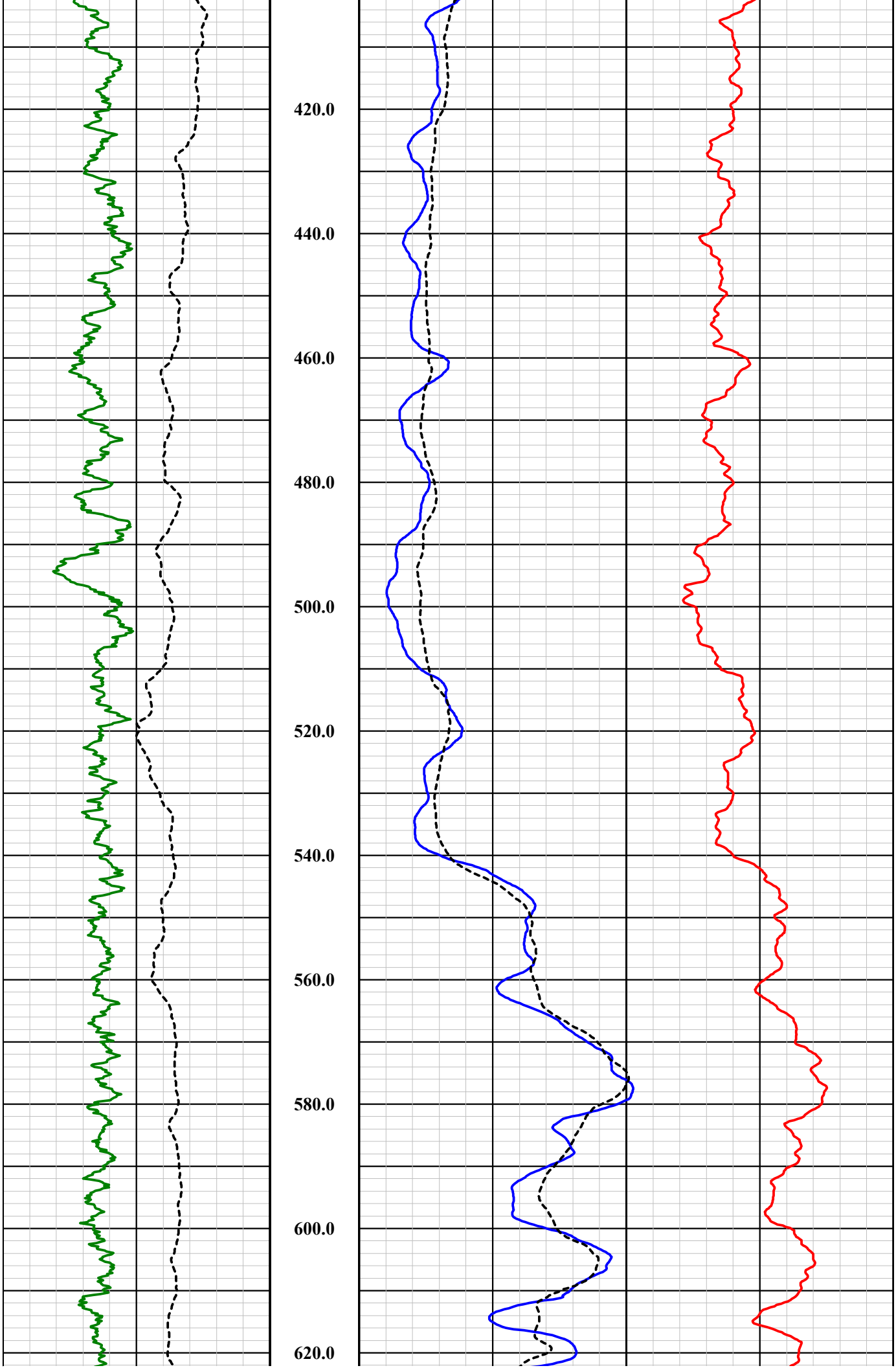
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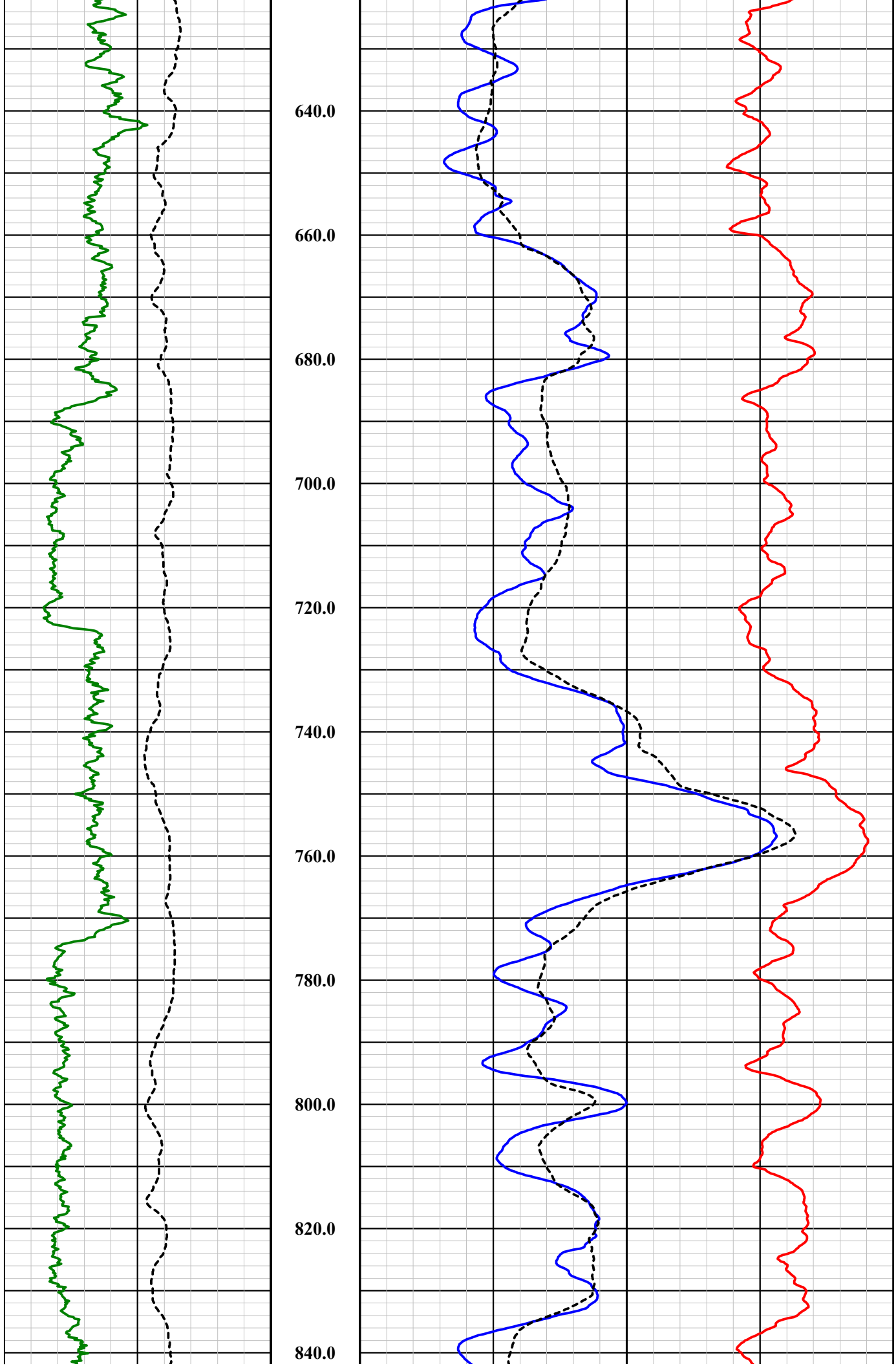
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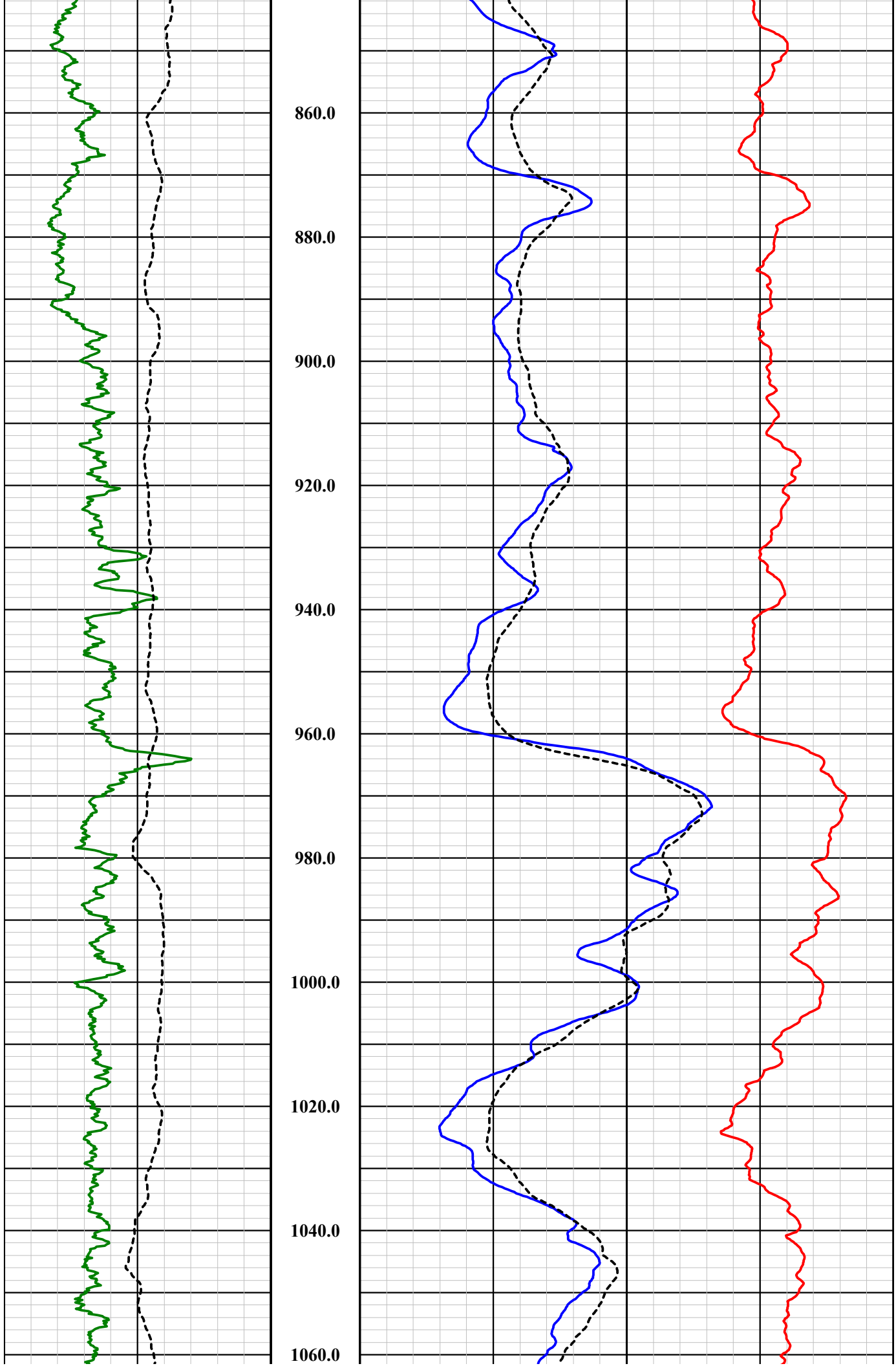
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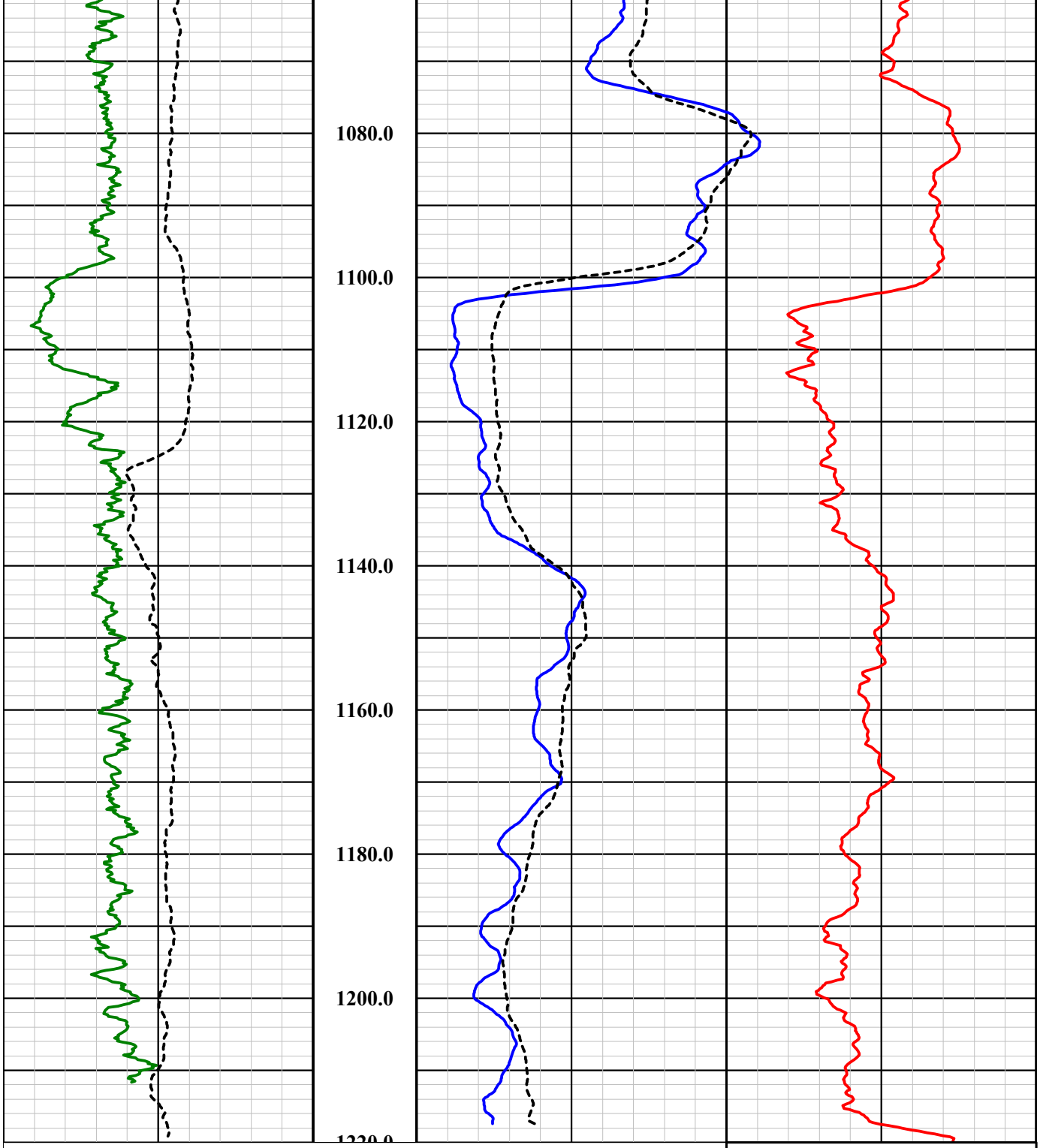


GeoVista E-Log Tool

Probe Top = Depth Ref.

Tool SN: 4035 & 4790

Bridle connects to wireline cablehead: Wireline armor is the B Electrode.

Four Conductor Probe Top

Bridle Electrode (N Electrode)

64" Normal Resistivity Electrode/Spontaneous Potential Electrode (M Electrode)

Probe Length = 2.3 m or 7.55 ft
Bridle Length = 10.0 m or 32.81 ft

Probe Weight = 7.0 kg or 15.4 lbs

Can only be collected in fluid

Isolation Bridle - Not shown in diagram but is necessary for operation

Electrode Measuring Points (from bottom of probe)
- Spontaneous Potential (SP): 0.65 m or 2.13 ft
- 16" Normal Resistivity (16" NRes): 0.50 m or 1.64 ft
- 64" Normal Resistivity (64" NRes): 1.10 m or 3.61 ft
- Single Point Resistance (SPR): 0.25 m or 0.82 ft

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)

16" Normal Resistivity Electrode (M Electrode)

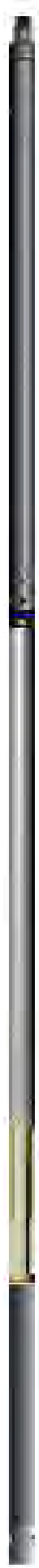
Current Electrode/Single Point Resistance (A Electrode)

1.65" or 42 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC

borehole geophysics & video services

Company	FLORENCE COPPER
Well	O-05B
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final E-Log Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	O-05B
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: GAMMA - CALIPER
MORE: TEMP. / FLUID RES.

LOCATION

SEC TWP RGE

OTHER SERVICES
E-LOG
SONIC
DEVIATION

PERMANENT DATUM	ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL	G.L.

DATE	6-16-17	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	GAMMA - CALIPER - TFR	VISCOSITY	N/A
DEPTH-DRILLER	1220 FT.	LEVEL	FULL
DEPTH-LOGGER	1215 FT.	MAX. REC. TEMP.	34.44 DEG. C
BTM LOGGED INTERVAL	1215 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	NATIONAL	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	A. OLSON / E. TURNER	TOOL STRING/SN	MSI COMBO TOOL 4183
WITNESSED BY	LAUREN - H & A	LOG TIME:ON SITE/OFF SITE	7:00 P.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	40 FT.
2	12 1/4 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

.

Tool Summary:

Date	6-16-17	**Date**	6-16-17	**Date**	6-16-17	**Date**		**Date**	
Run No.	1	**Run No.**	2	**Run No.**	3	**Run No.**	4	**Run No.**	5
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	MSI 60MM SONIC	**Tool Model**	MSI DEVIATION	**Tool Model**	
Tool SN	4183	**Tool SN**	4790	**Tool SN**	5001	**Tool SN**	6002	**Tool SN**	
From	SURFACE	**From**	SURFACE	**From**	SURFACE	**From**	SURFACE	**From**	
To	1215 FT.	**To**	1215 FT.	**To**	1215 FT.	**To**	1215 FT.	**To**	
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	
Truck No	900	**Truck No**	900	**Truck No**	900	**Truck No**	900	**Truck No**	
Operation Check	6-15-17	**Operation Check**	6-15-17	**Operation Check**	6-15-17	**Operation Check**	6-15-17	**Operation Check**	
Calibration Check	6-15-17	**Calibration Check**	6-15-17	**Calibration Check**	N/A	**Calibration Check**	N/A	**Calibration Check**	
Time Logged	7:40 P.M.	**Time Logged**	8:40 P.M.	**Time Logged**	9:20 P.M.	**Time Logged**	10:30 P.M.	**Time Logged**	

Additional Comments:

Caliper Arms Used: 15 IN. **Calibration Points:** 8 IN. & 23 IN.

E-Log Calibration Range: 1-1000 OHM-M **Calibration Points:** 1 & 1000 OHM-M

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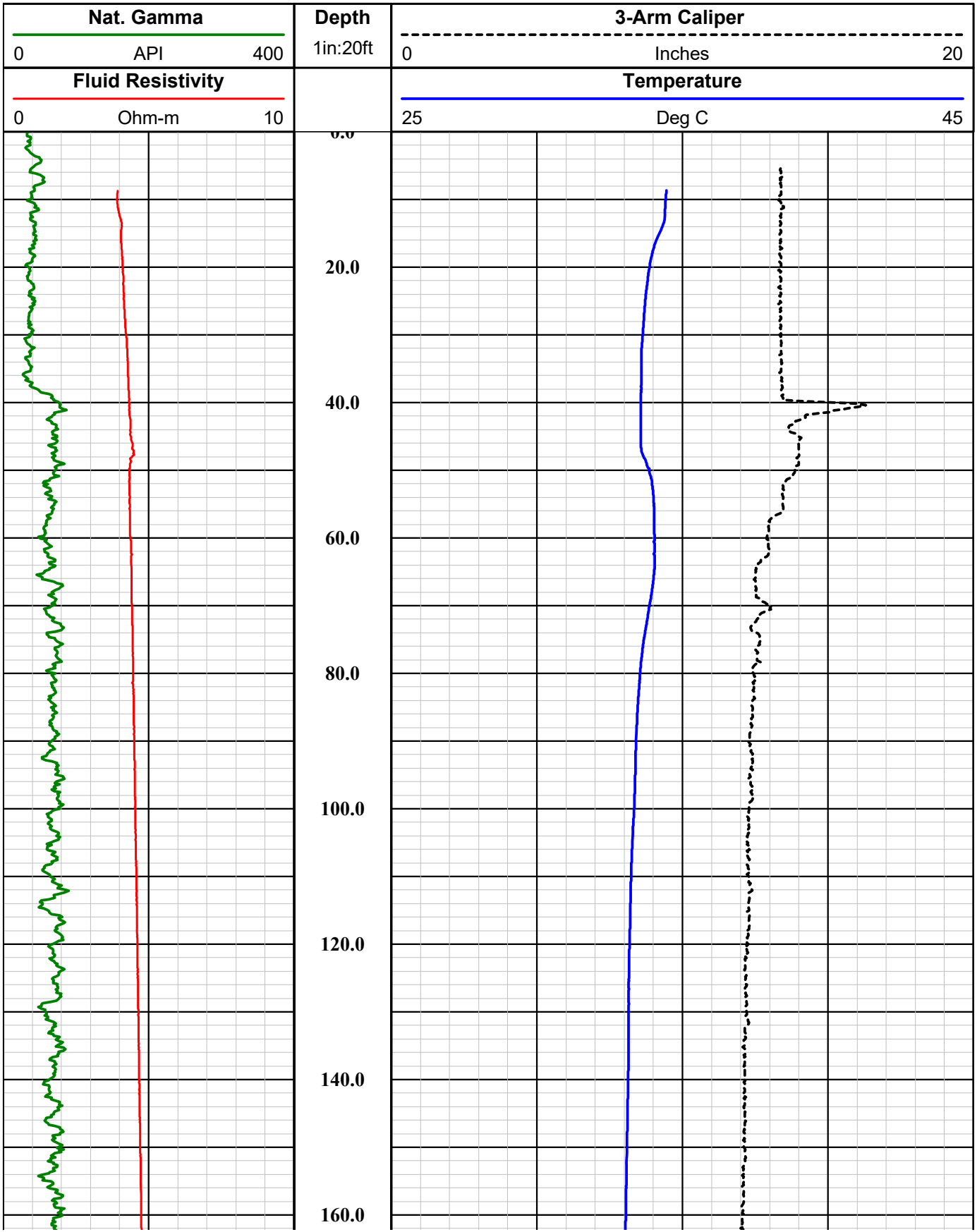

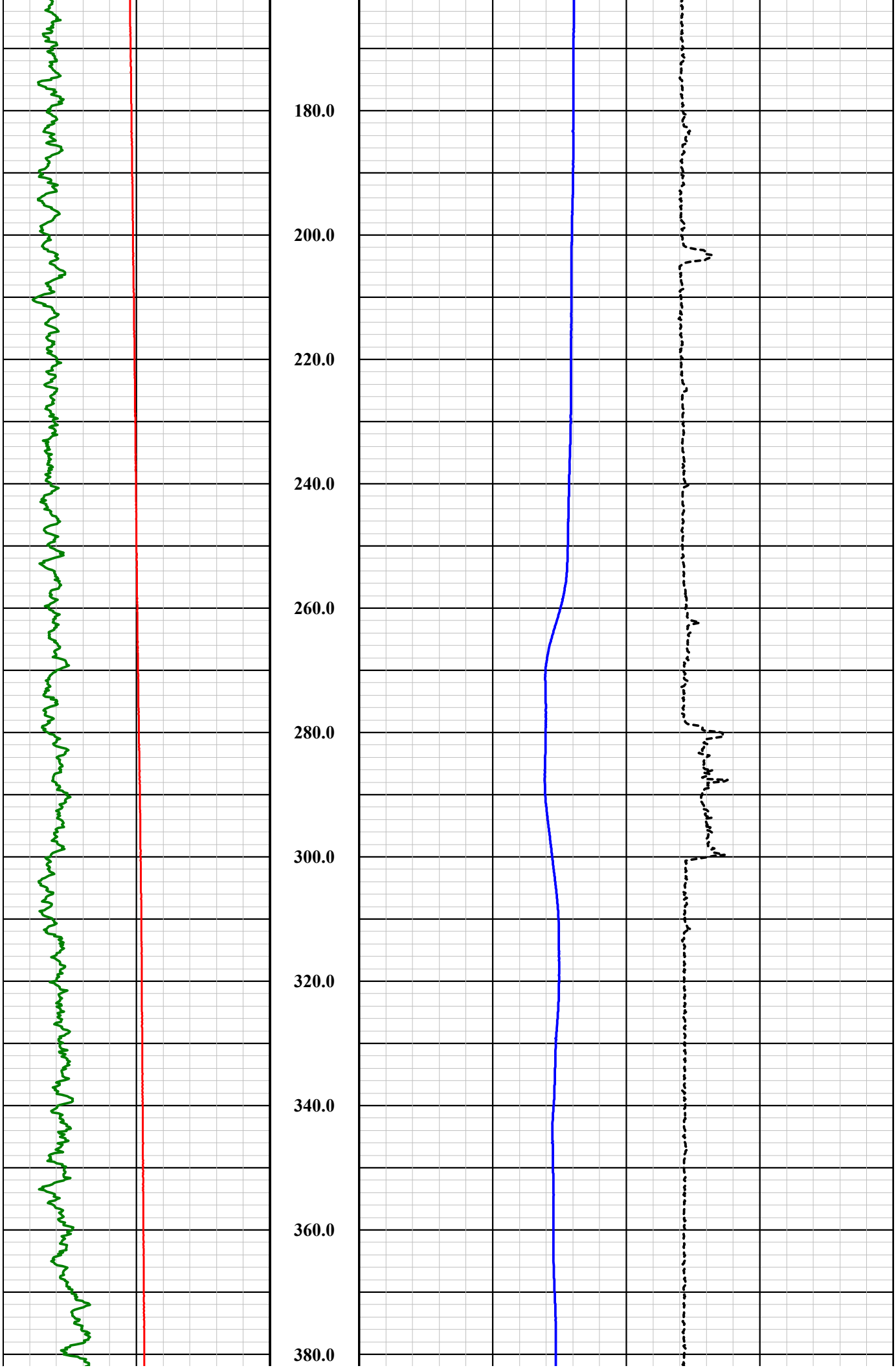
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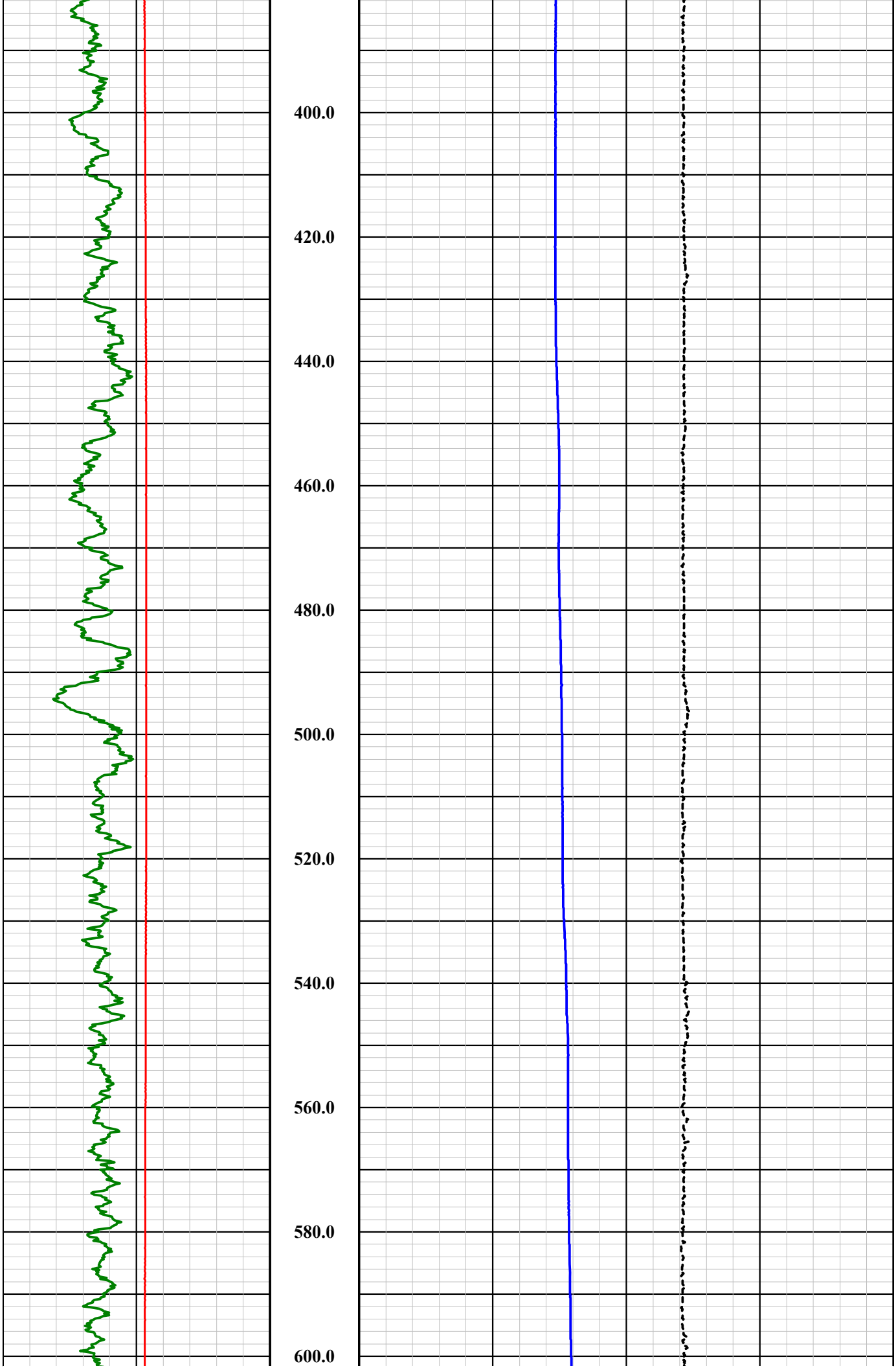
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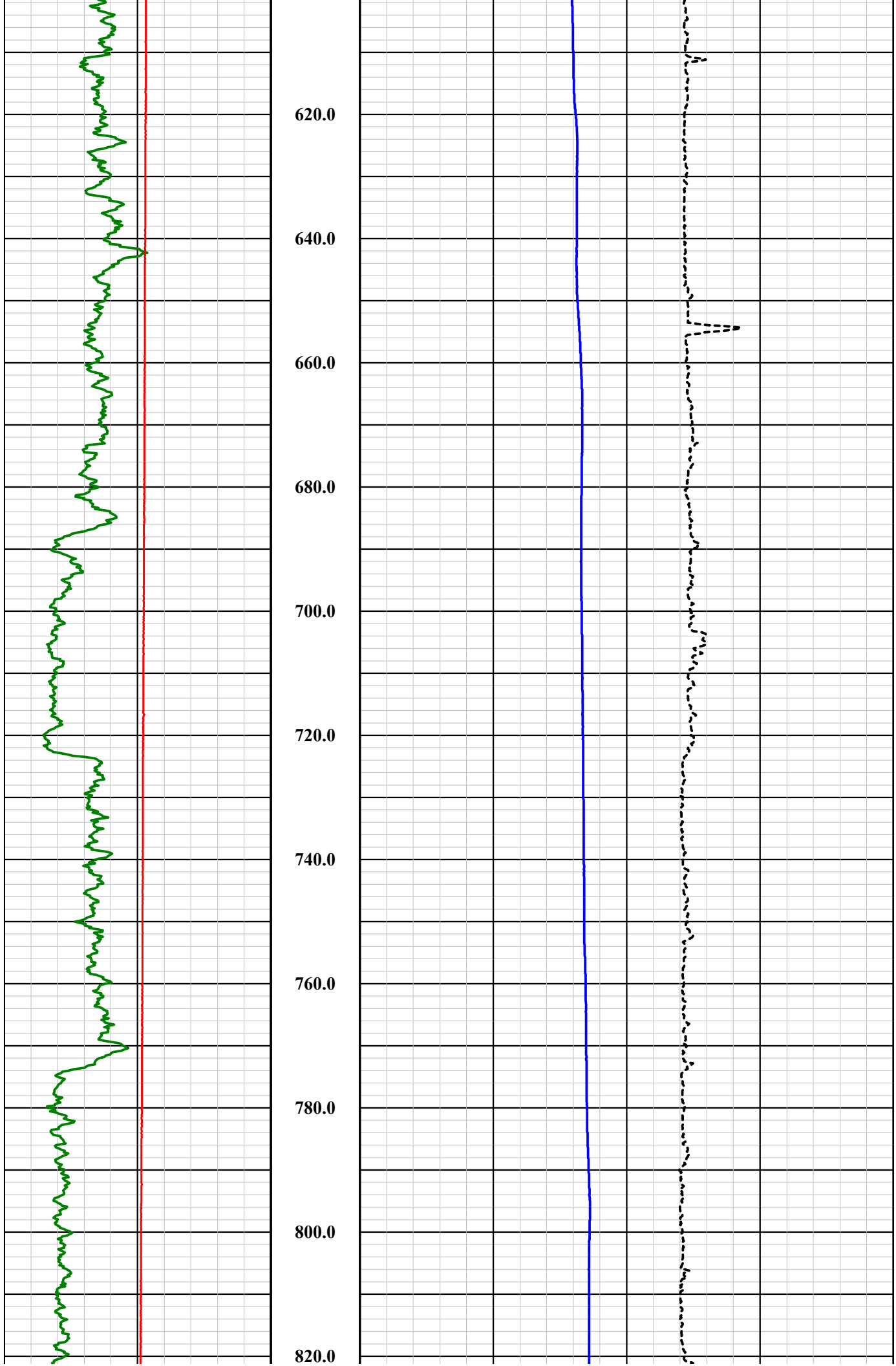
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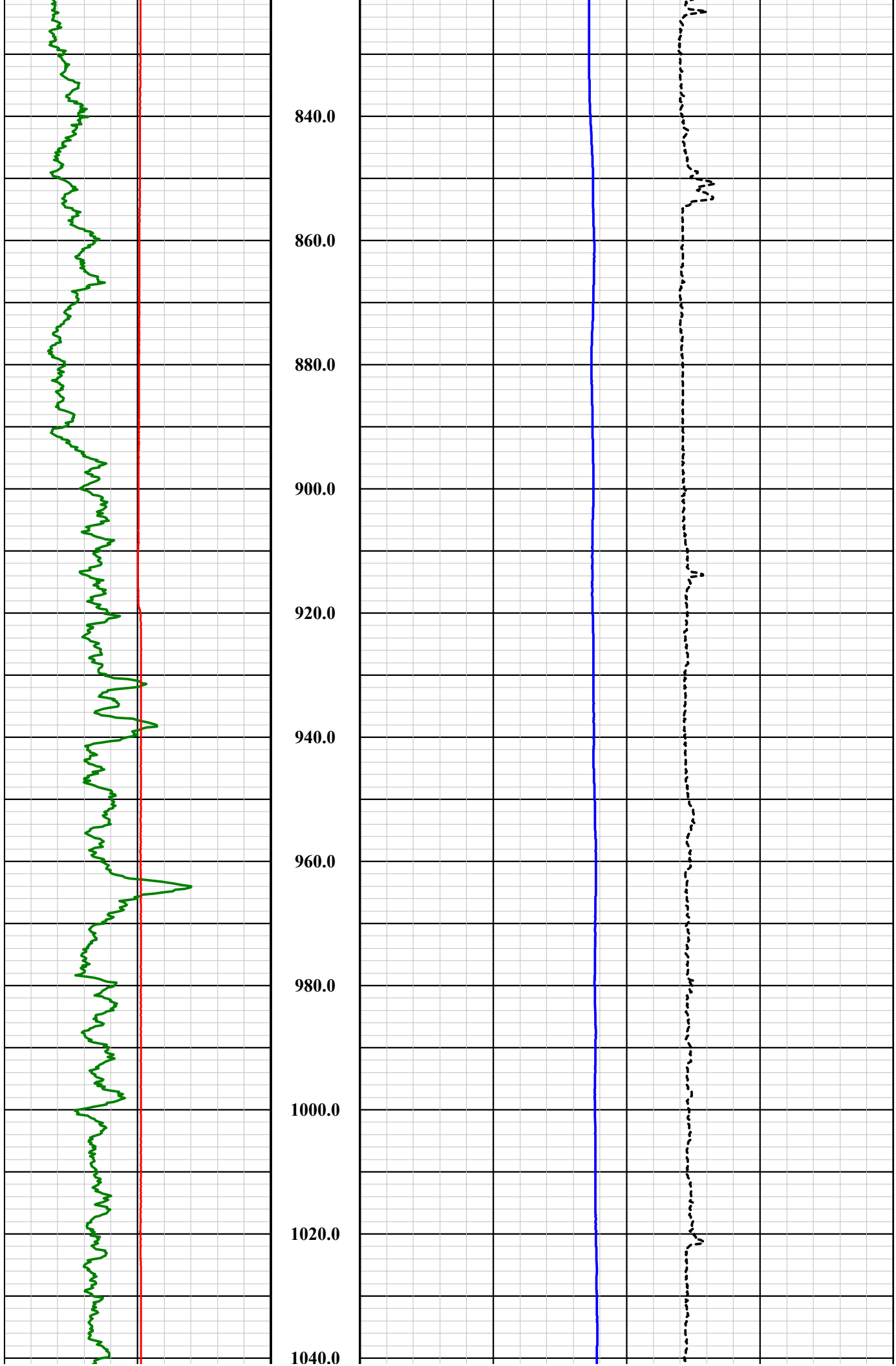
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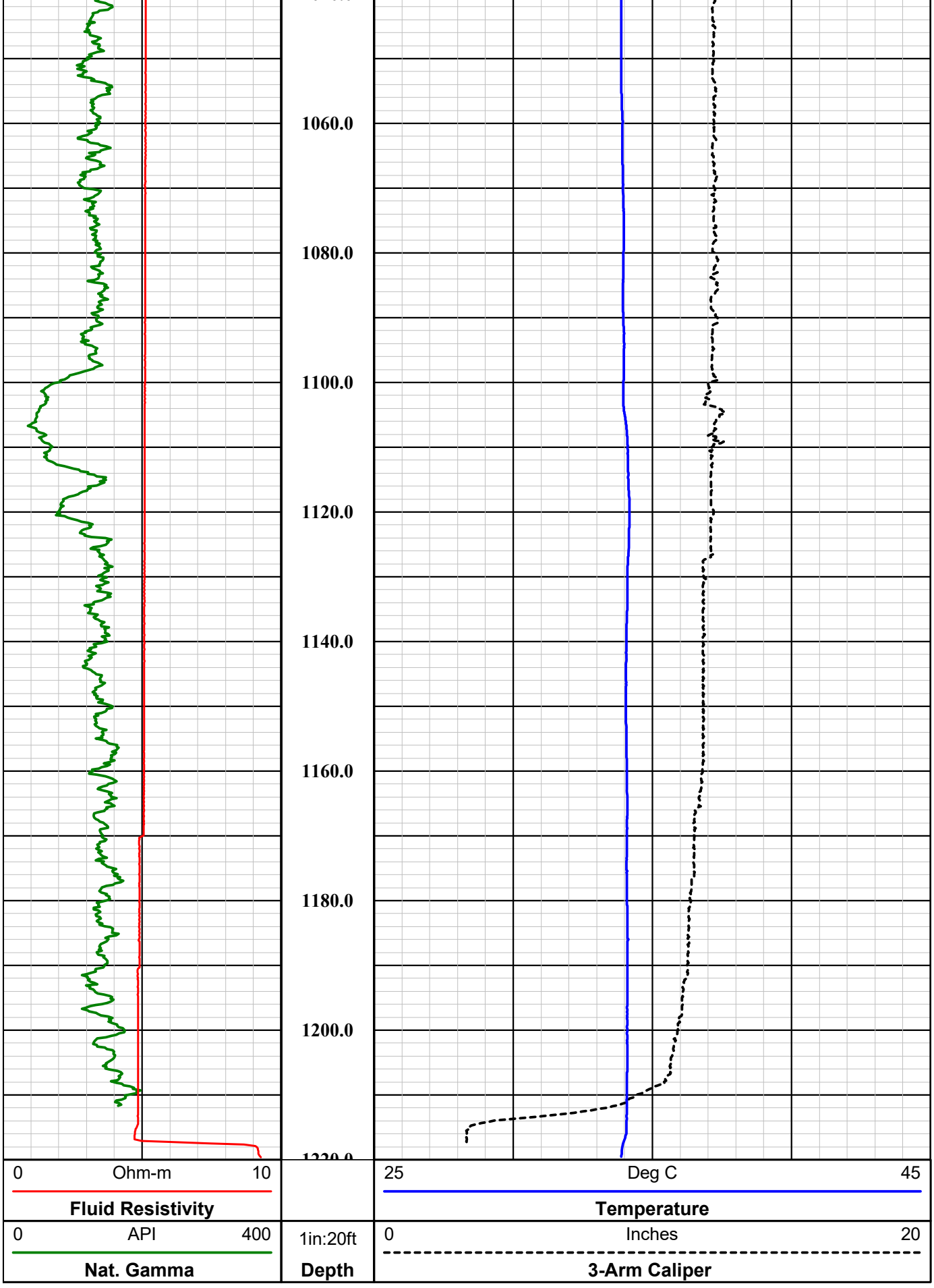
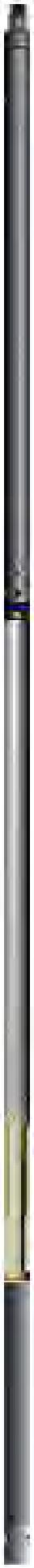


MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

	Company	FLORENCE COPPER

Southwest Exploration Services, LLC

borehole geophysics & video services

Well	O-05B
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final GCT Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	O-05B
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: MSI 60mm SONIC
MORE: GAMMA - CALIPER

LOCATION

SEC TWP RGE

OTHER SERVICES
E-LOG
TEMPERATURE
FLUID RESISTIVITY
DEVIATION

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	6-16-17	TYPE FLUID IN HOLE	MUD
RUN No	1 & 3	MUD WEIGHT	N/A
TYPE LOG	SONIC - GAMMA - CALIPER	VISCOSITY	N/A
DEPTH-DRILLER	1220 FT.	LEVEL	FULL
DEPTH-LOGGER	1215 FT.	MAX. REC. TEMP.	34.44 DEG. C
BTM LOGGED INTERVAL	1215 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.25 FT.
DRILLER / RIG#	NATIONAL	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	A. OLSON / E. TURNER	TOOL STRING/SN	MSI 60mm SONIC SN 5001
WITNESSED BY	LAUREN - H & A	LOG TIME:ON SITE/OFF SITE	7:00 P.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	40 FT.
2	12 1/4 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

.

Tool Summary:

Date	6-16-17	**Date**	6-16-17	**Date**	6-16-17		
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	MSI 60MM SONIC		
Tool SN	4183	**Tool SN**	4790	**Tool SN**	5001		
From	SURFACE	**From**	SURFACE	**From**	SURFACE		
To	1215 FT.	**To**	1215 FT.	**To**	1215 FT.		
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON		
Truck No	900	**Truck No**	900	**Truck No**	900		
Operation Check	6-15-17	**Operation Check**	6-15-17	**Operation Check**	6-15-17		
Calibration Check	6-15-17	**Calibration Check**	6-15-17	**Calibration Check**	N/A		
Time Logged	7:40 P.M.	**Time Logged**	8:40 P.M.	**Time Logged**	9:20 P.M.		
Date	6-16-17	**Date**		**Date**			
Run No.	4	**Run No.**	5	**Run No.**	6		
Tool Model	MSI DEVIATION	**Tool Model**		**Tool Model**			
Tool SN	6002	**Tool SN**		**Tool SN**			
From	SURFACE	**From**		**From**			
To	1215 FT.	**To**		**To**			
Recorded By	A. OLSON	**Recorded By**		**Recorded By**			
Truck No	900	**Truck No**		**Truck No**			
Operation Check	6-15-17	**Operation Check**		**Operation Check**			
Calibration Check	N/A	**Calibration Check**		**Calibration Check**			
Time Logged	10:30 P.M.	**Time Logged**		**Time Logged**			

Additional Comments:

Caliper Arms Used: 15 IN. **Calibration Points:** 8 IN. & 23 IN.

E-Log Calibration Range: 1-1000 OHM-M **Calibration Points:** 1 & 1000 OHM-M

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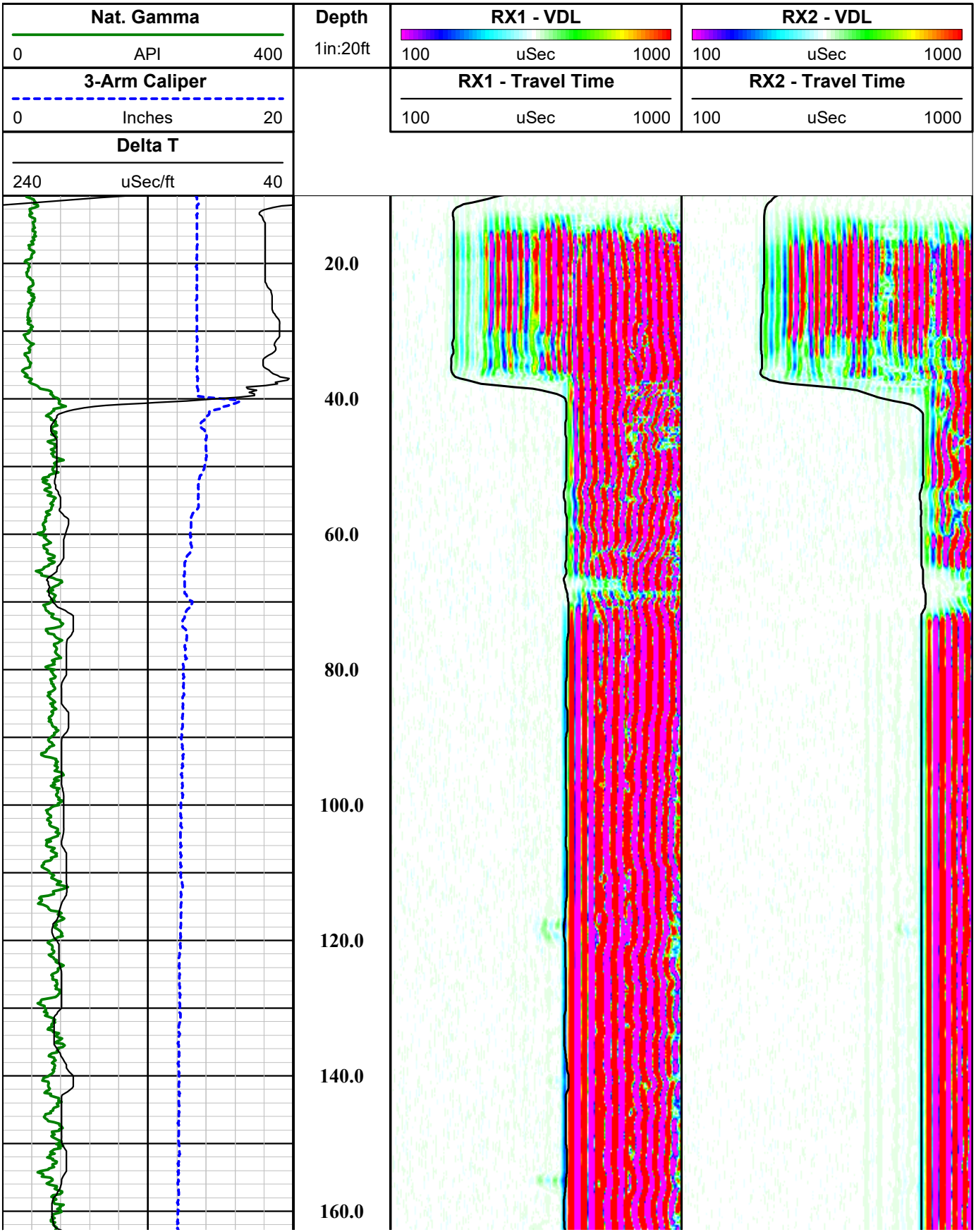

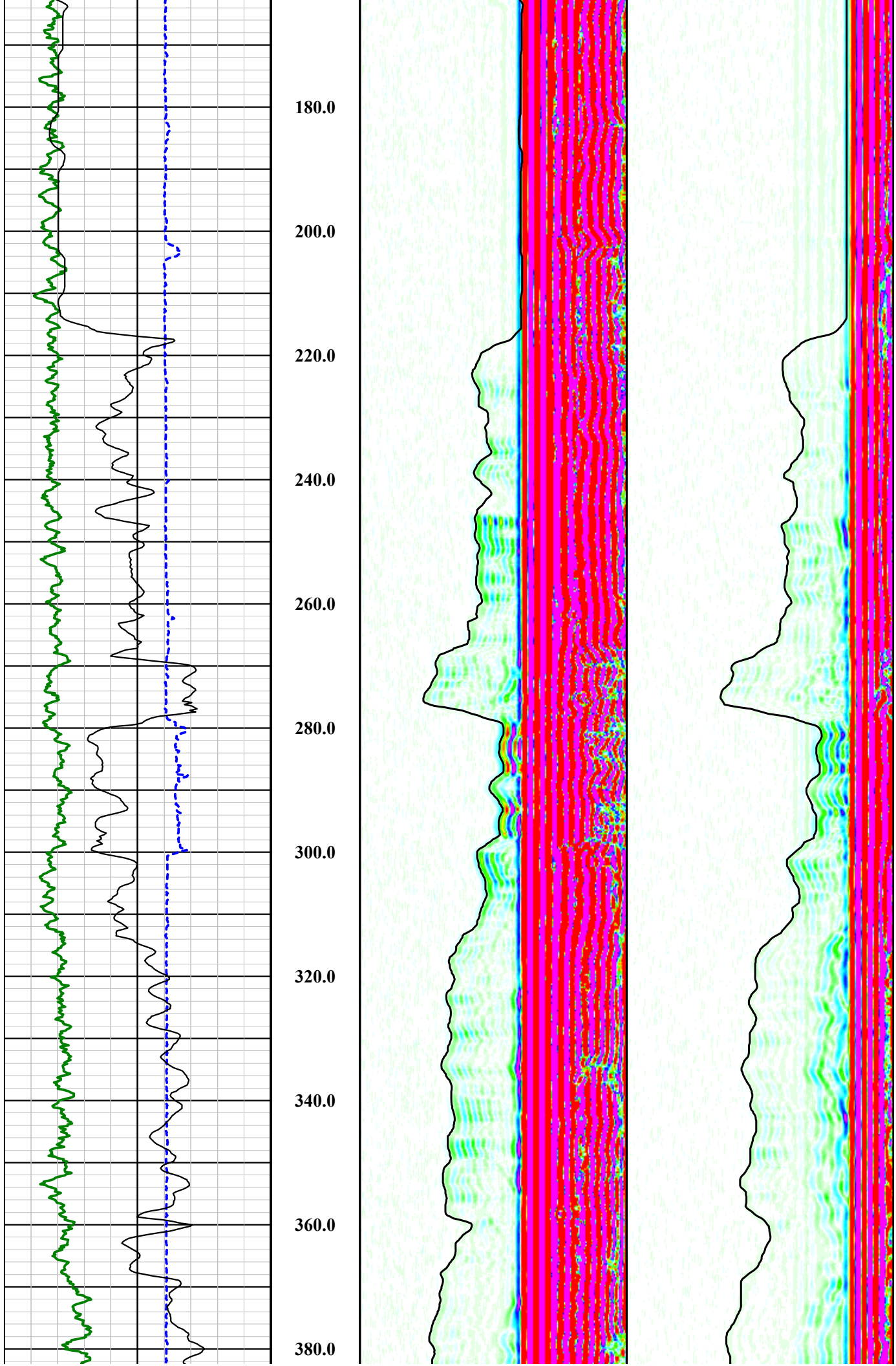
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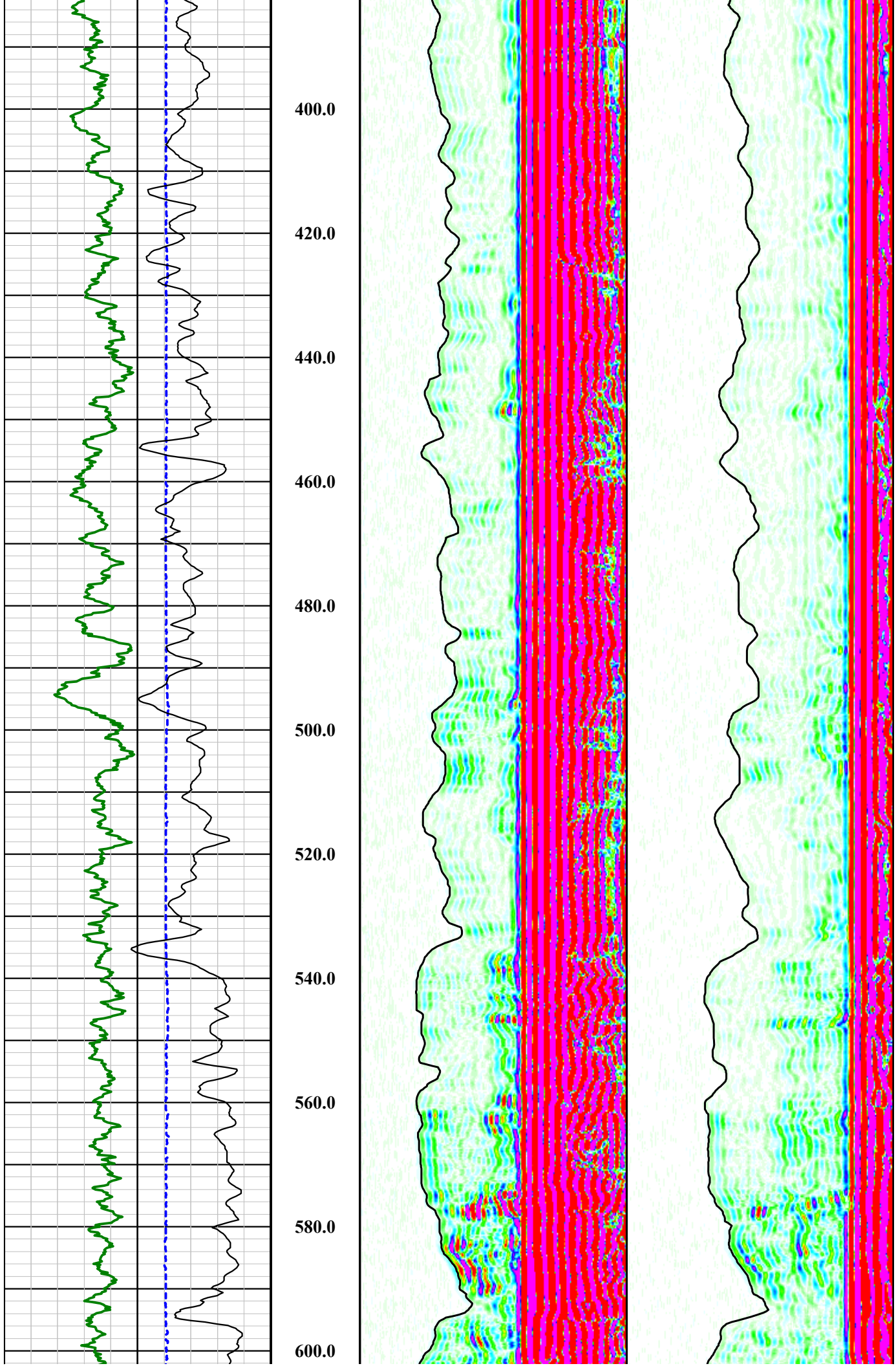
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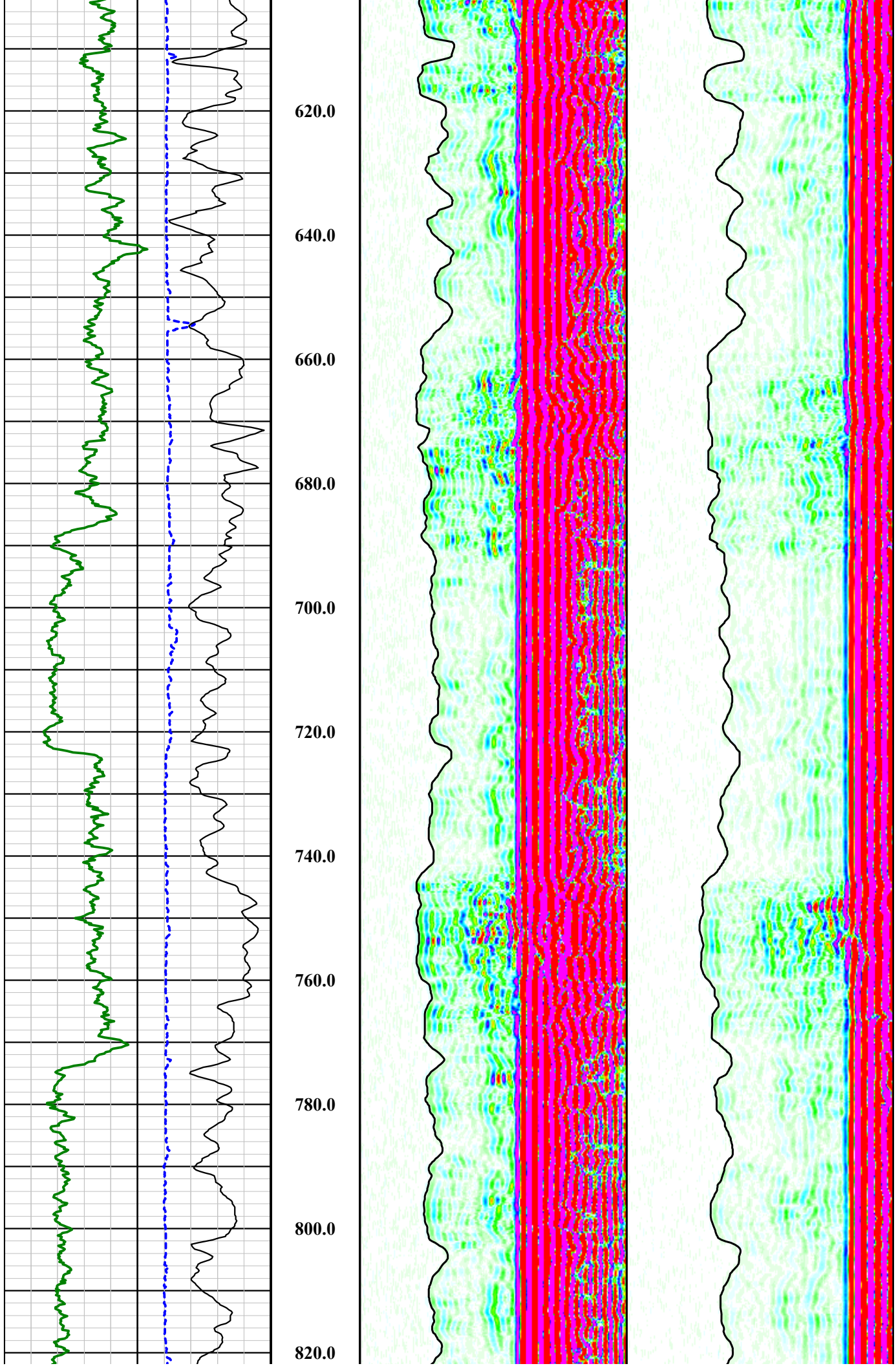
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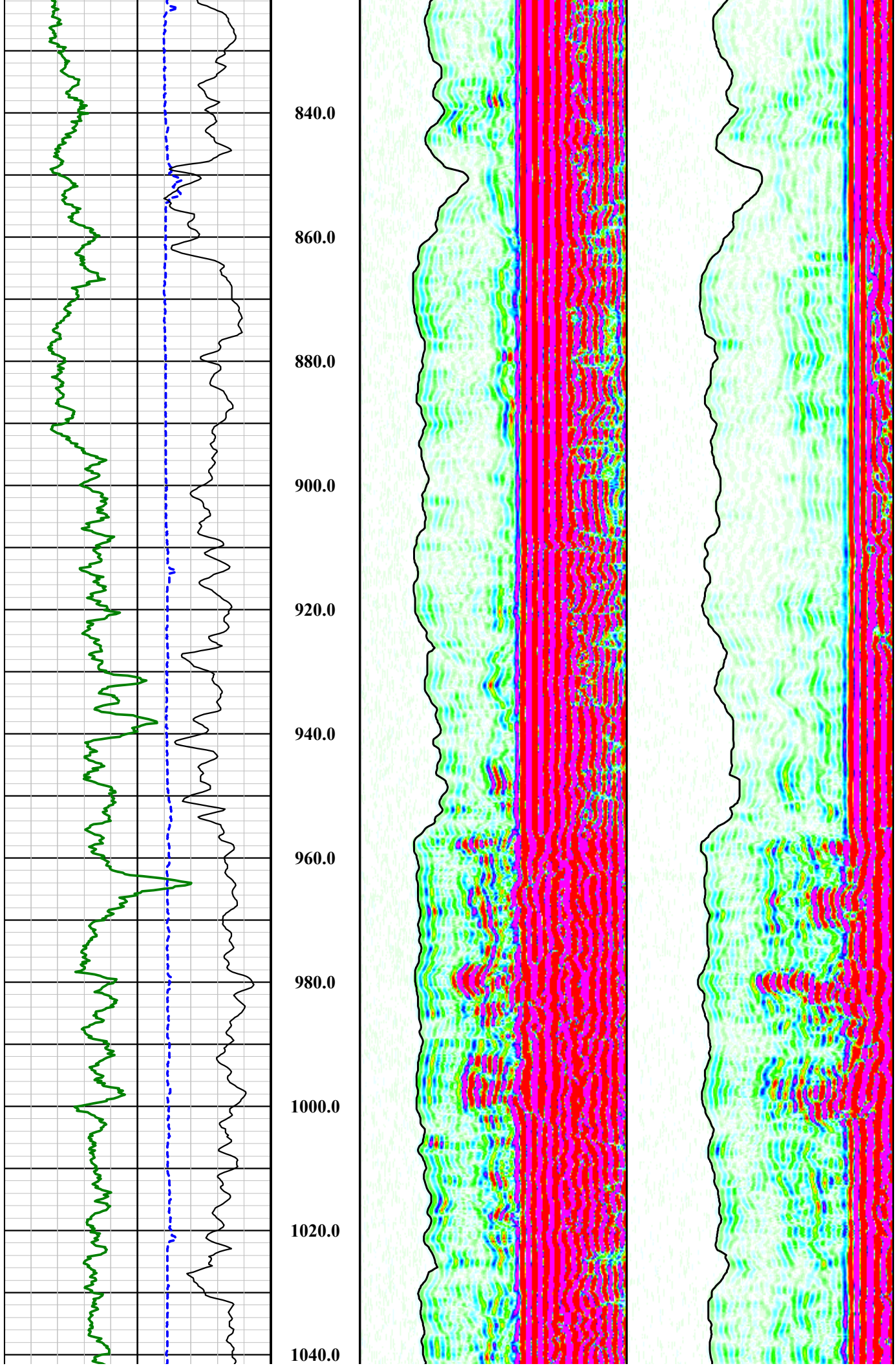
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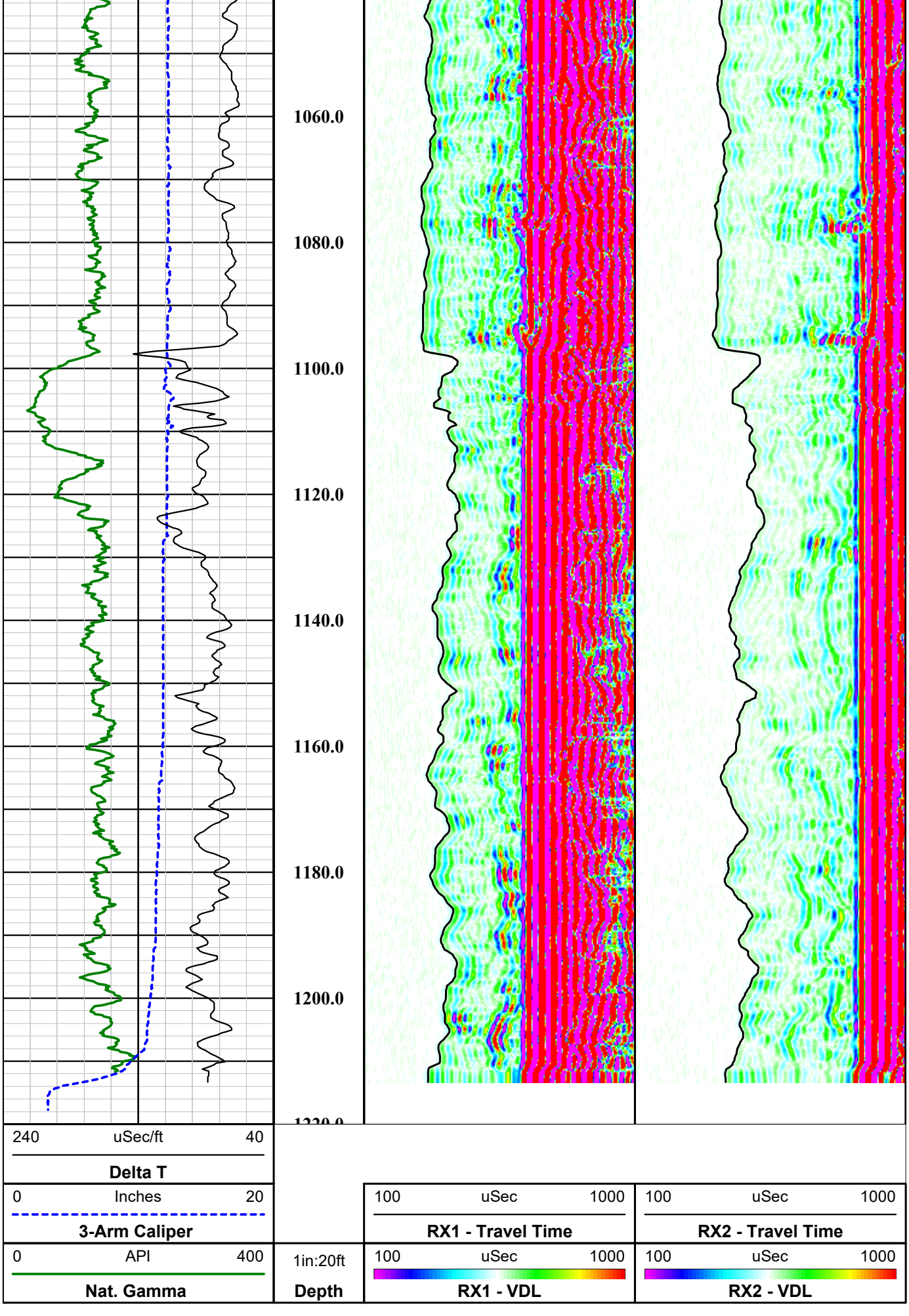


MSI 60 mm 2 RX Full Waveform Sonic Tool

Probe Top = Depth Ref.

Tool SN: 5001, 5050 & 6003

Four Conductor MSI Probe Top

Probe Length = 2.8 m or 9.19 ft
Probe Weight = ~26.5 kg or 58.4 lbs

Sensors: Ceramic Piezoelectric

Transmitter Frequency: 24 - 28 kHz resonant frequency

Rx - Rx Spacing: 0.3 m (12.0 in)

Typically centralized with external centralizers

Can only be collected in fluid

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)

Rx-2 Tx - Rx2 Spacing = 1.22 m (48.0 in)

Rx-1 Tx - Rx1 Spacing = .91 m (36.0 in)

Acoustic Isolater

Tx = Acoustic Transmitter

0.660 m or 26.0 in. - End of tool to center of Tx

2.36 in or 60 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.

Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	O-05B
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Sonic Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	O-05B
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: REAM CALIPER
MORE: W / VOLUME CALC.

LOCATION

SEC TWP RGE

OTHER SERVICES
E-LOG
SONIC
DEVIATION
NAT. GAMMA
TEMPERATURE
FLUID RESISTIVITY

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	6-16-17	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	REAM CALIPER W / VOLUME	VISCOSITY	N/A
DEPTH-DRILLER	1220 FT.	LEVEL	FULL
DEPTH-LOGGER	1215 FT.	MAX. REC. TEMP.	34.44 DEG. C
BTM LOGGED INTERVAL	1215 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	NATIONAL	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	A. OLSON / E. TURNER	TOOL STRING/SN	MSI COMBO TOOL 4183
WITNESSED BY	LAUREN - H & A	LOG TIME:ON SITE/OFF SITE	6:00 AM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	40 FT.
2	12 1/4 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

.

Tool Summary:

Date	6-16-17	**Date**	6-16-17	**Date**	6-16-17	**Date**		**Date**	
Run No.	1	**Run No.**	2	**Run No.**	3	**Run No.**	4	**Run No.**	5
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	MSI 60MM SONIC	**Tool Model**	MSI DEVIATION	**Tool Model**	
Tool SN	4183	**Tool SN**	4790	**Tool SN**	5001	**Tool SN**	6002	**Tool SN**	
From	SURFACE	**From**	SURFACE	**From**	SURFACE	**From**	SURFACE	**From**	
To	1215 FT.	**To**	1215 FT.	**To**	1215 FT.	**To**	1215 FT.	**To**	
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	
Truck No	900	**Truck No**	900	**Truck No**	900	**Truck No**	900	**Truck No**	
Operation Check	6-15-17	**Operation Check**	6-15-17	**Operation Check**	6-15-17	**Operation Check**	6-15-17	**Operation Check**	
Calibration Check	6-15-17	**Calibration Check**	6-15-17	**Calibration Check**	N/A	**Calibration Check**	N/A	**Calibration Check**	
Time Logged	7:40 P.M.	**Time Logged**	8:40 P.M.	**Time Logged**	9:20 P.M.	**Time Logged**	10:30 P.M.	**Time Logged**	

Additional Comments:

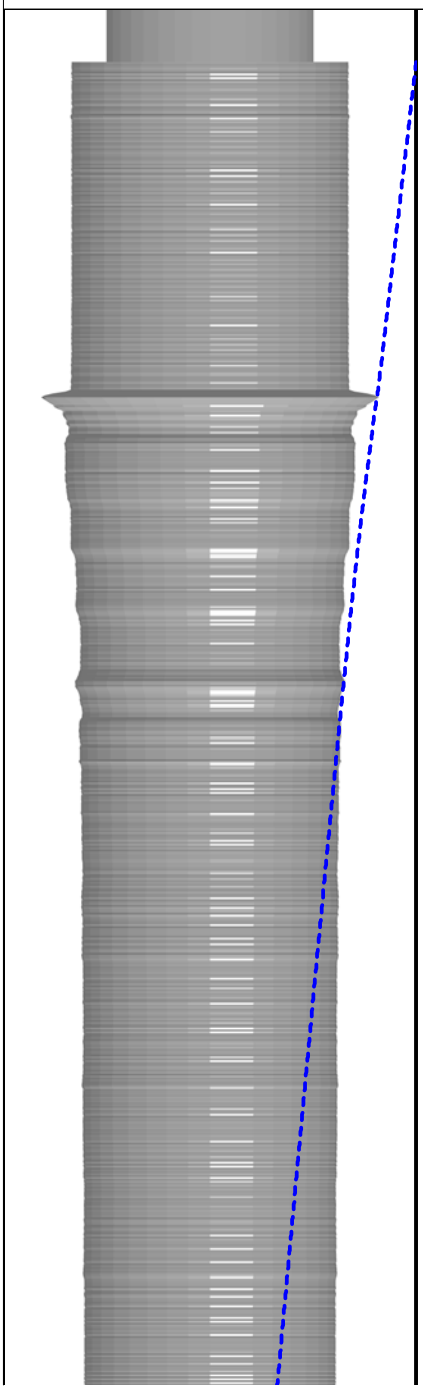
Caliper Arms Used: 15 IN. **Calibration Points:** 8 IN. & 23 IN.

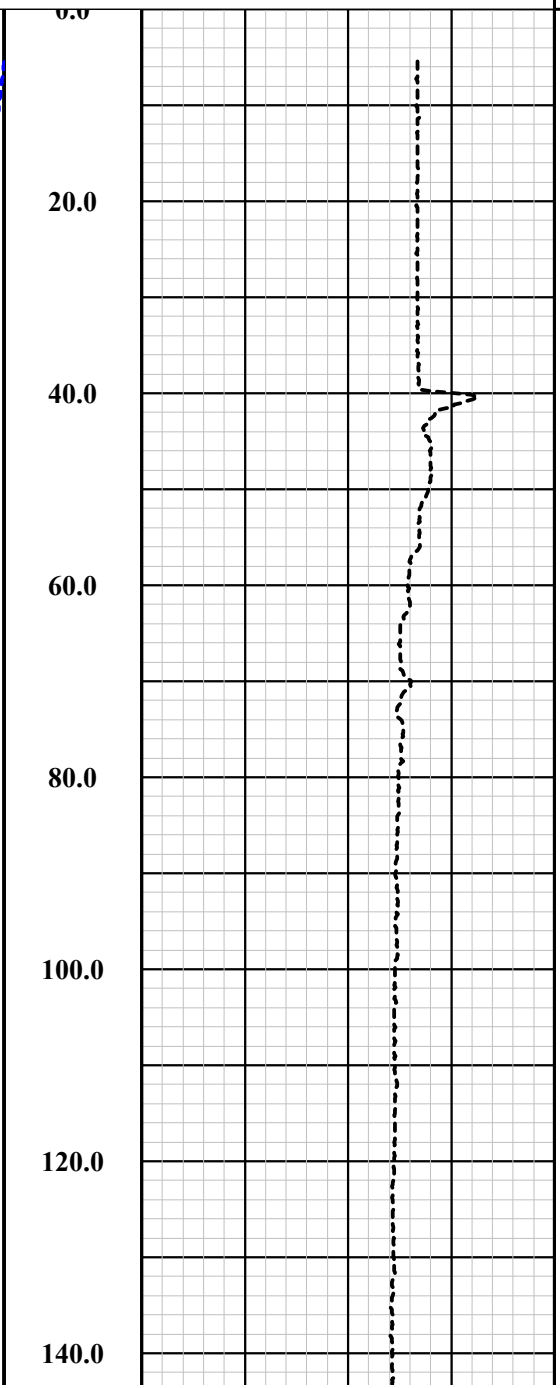
E-Log Calibration Range: 1-1000 OHM-M **Calibration Points:** 1 & 1000 OHM-M

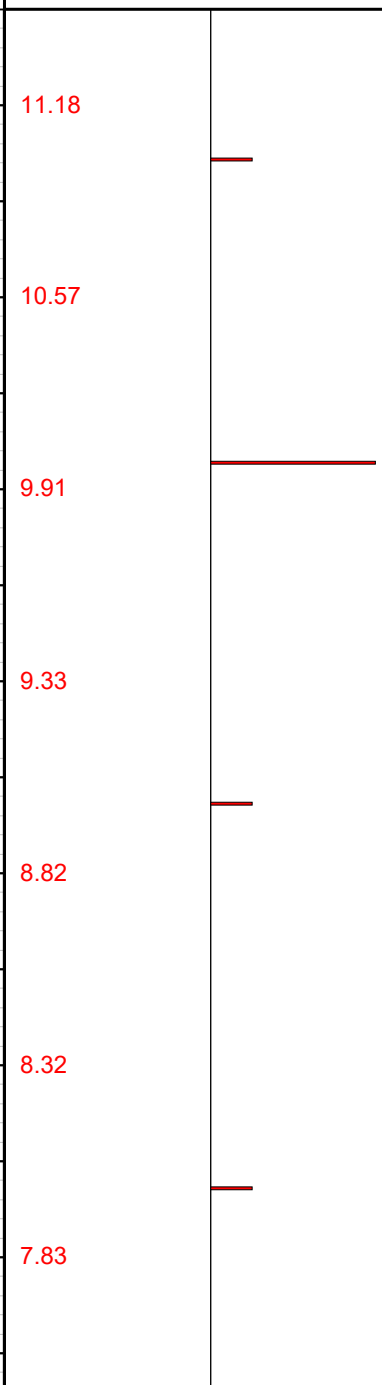
Disclaimer:

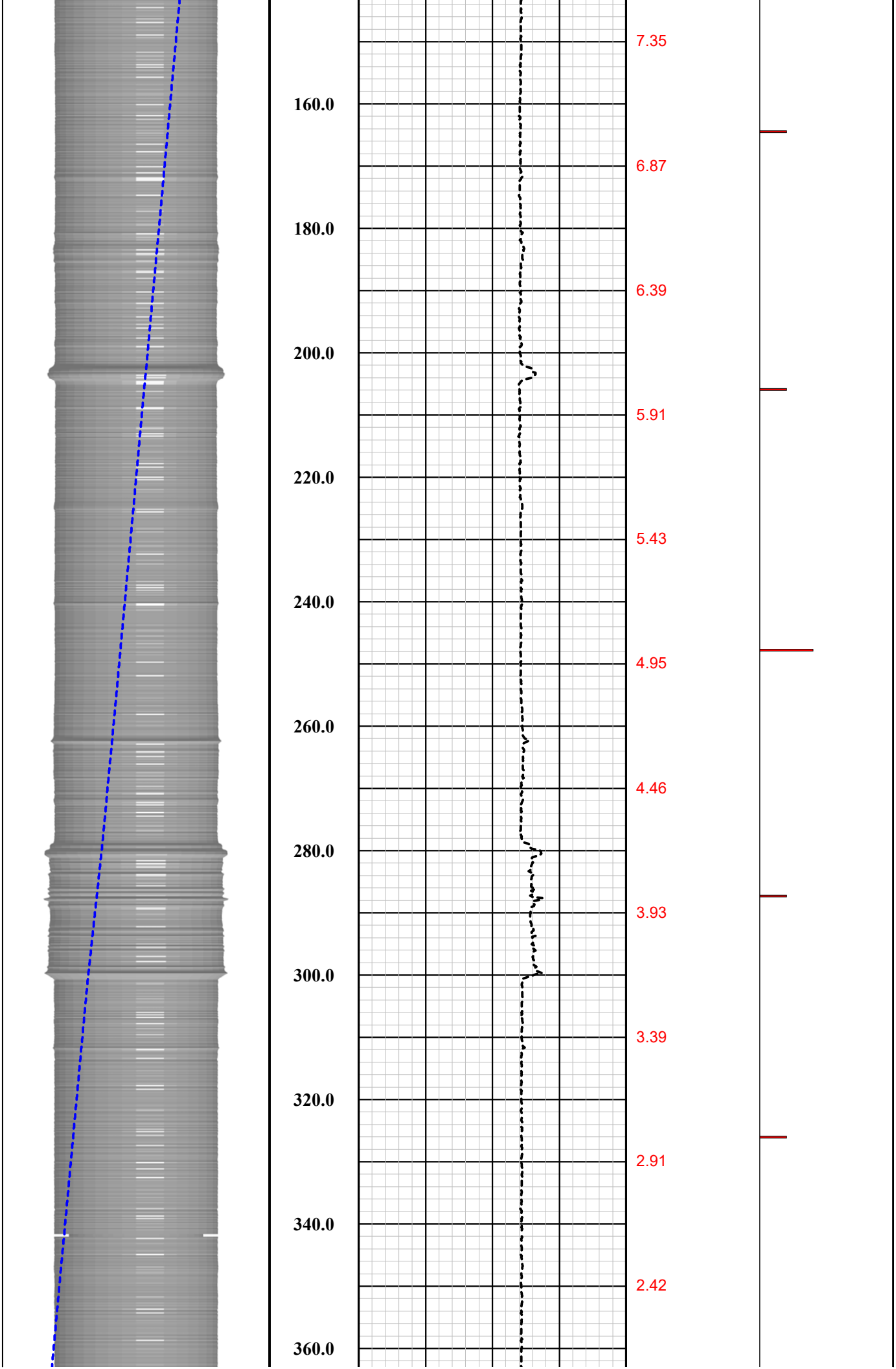
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

Total Volume 5.562"	Depth	3-Arm Caliper	Cumulated Vol. FG (cu.yd)
0 cu.yd 17.87	1in:20ft	0 Inches 20	
Total Volume 5.31"			**Cumulated Vol. PVC (cu.yd)**
0 cu.yd 11.31			
3-D View			**Based on 5.31" OD Casing**
-0°			**Based on 5.562" OD Casing**





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200.0
220.0
240.0
260.0
280.0
300.0
320.0
340.0
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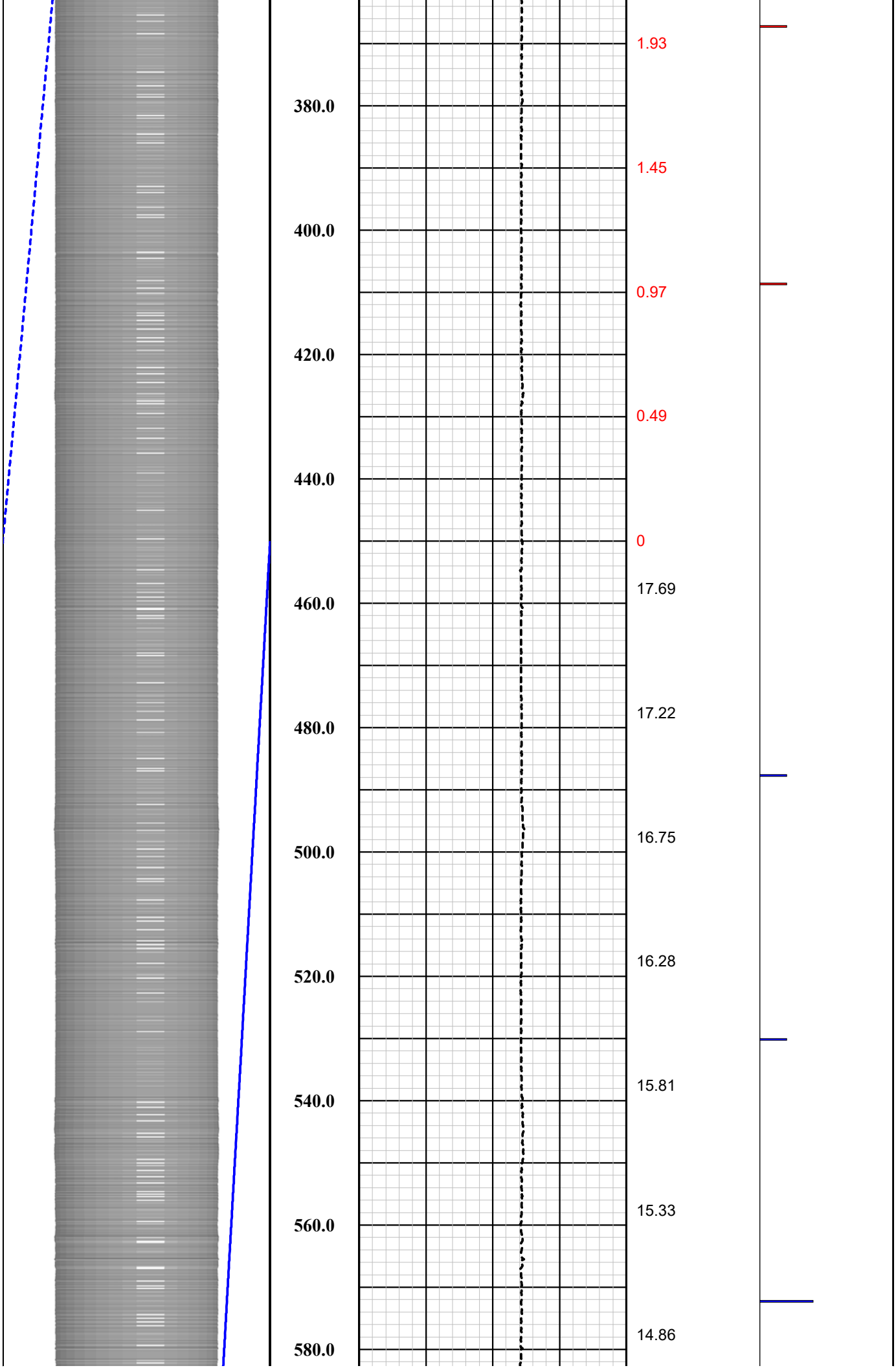
5.91
5.43
4.95
4.46
3.93
3.39
2.91
2.42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420.0
440.0
460.0
480.0
500.0
520.0
540.0
560.0
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0.97
0.49
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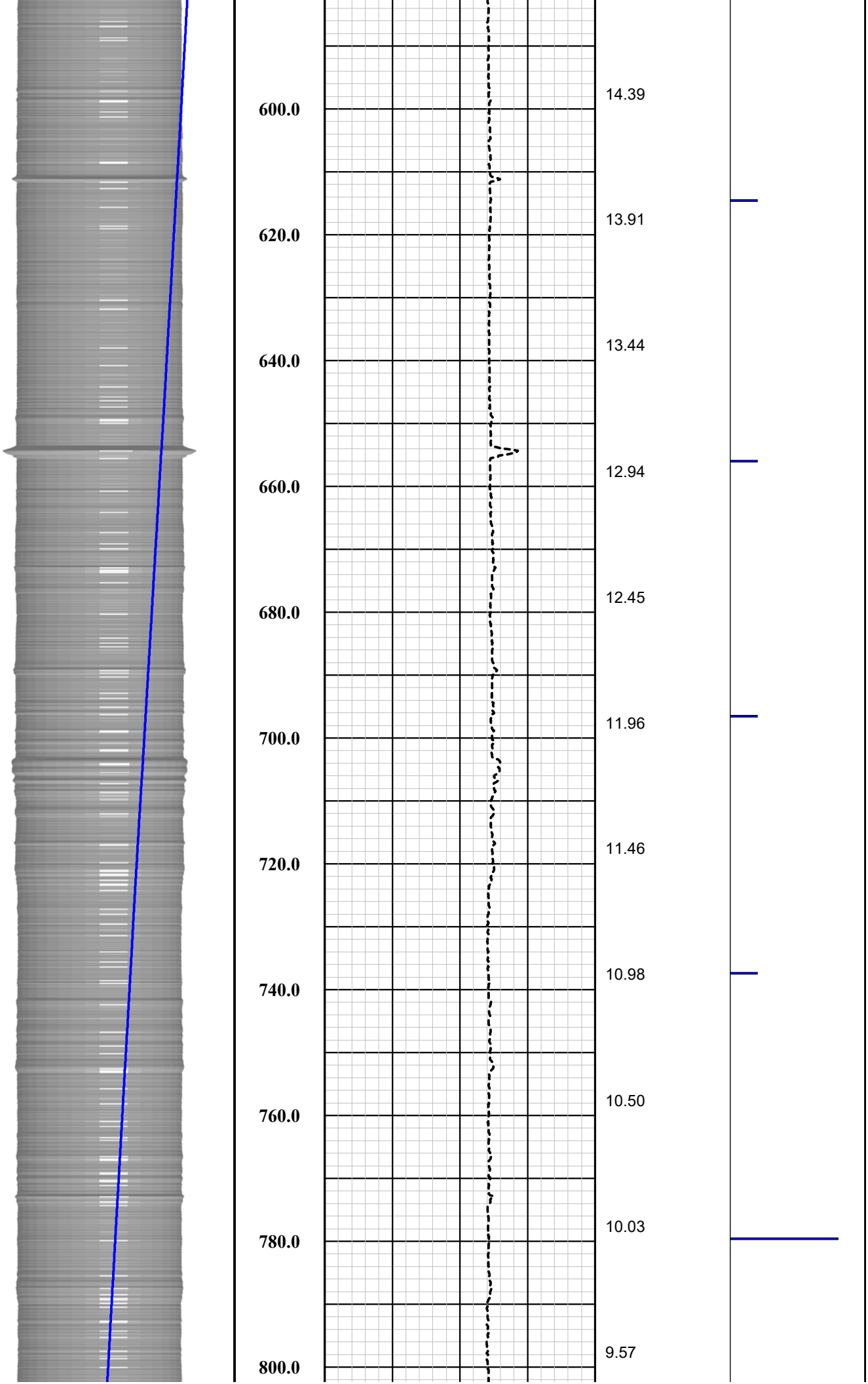
17.22
16.75
16.28
15.81
15.33
14.86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640.0
660.0
680.0
700.0
720.0
740.0
760.0
780.0
800.0
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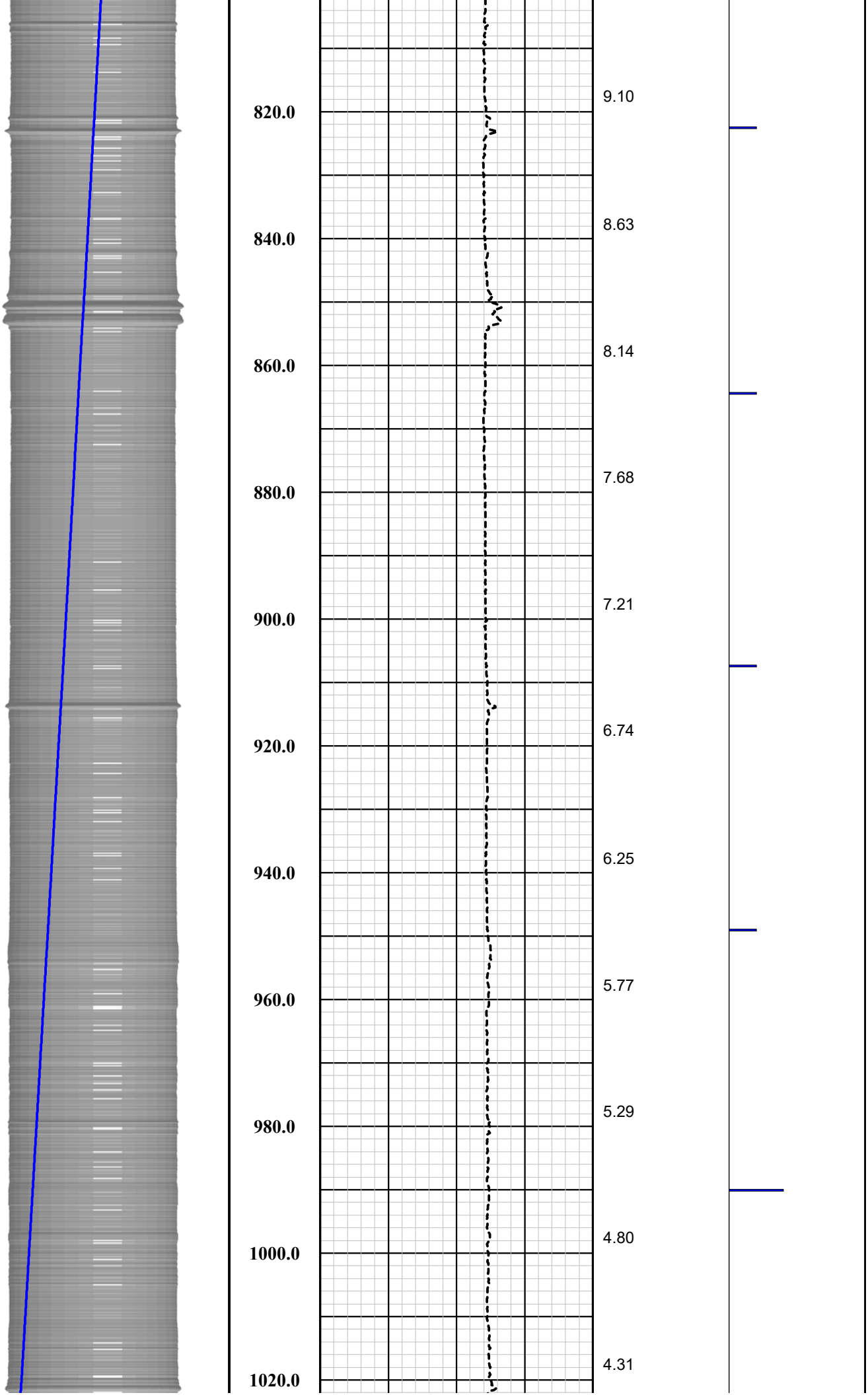
13.91
13.44
12.94
12.45
11.96
11.46
10.98
10.50
10.03
9.57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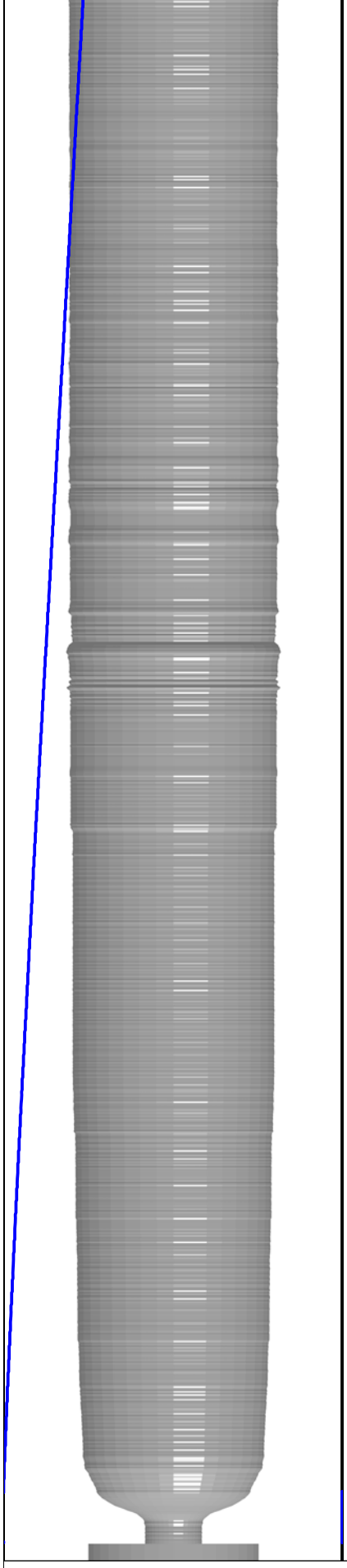
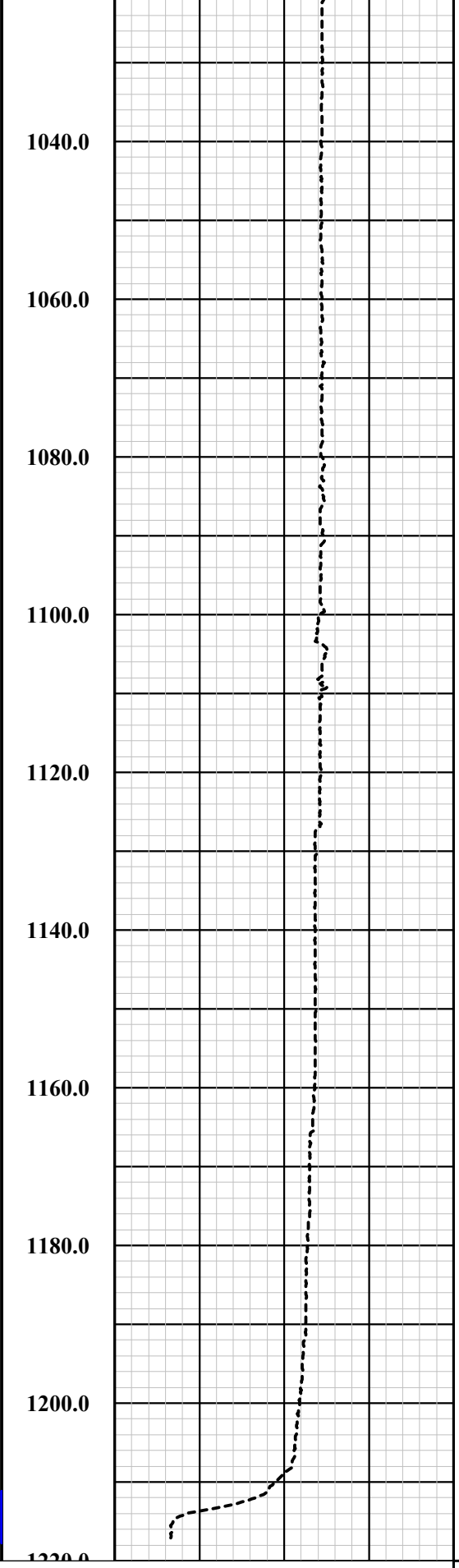
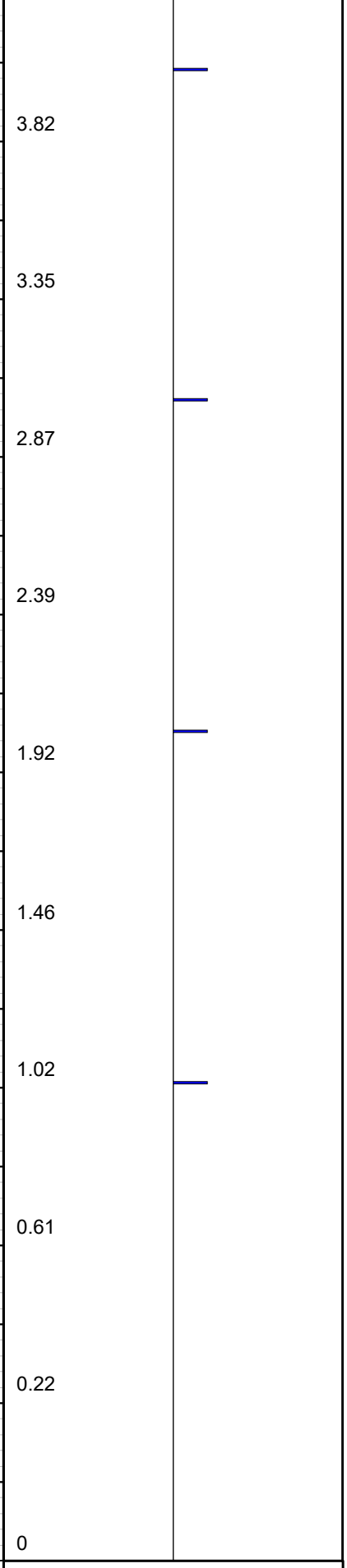
840.0
860.0
880.0
900.0
920.0
940.0
960.0
980.0
1000.0
1020.0
9.10
8.63
8.14
7.68
7.21
6.74
6.25
5.77
5.29
4.80
4.31







Based on 5.562" OD Casing

Based on 5.31" OD Casing

-0°

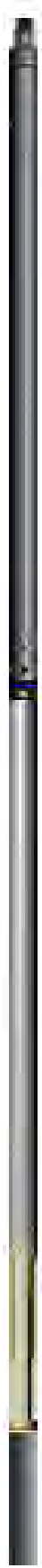
3-D View

0 cu.yd 11.31

Total Volume 5.31"			Cumulated Vol. PVC (cu.yd)
0 cu.yd 17.87 Total Volume 5.562"	1in:20ft Depth	0 Inches 20 3-Arm Caliper	Cumulated Vol. FG (cu.yd)

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

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1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	O-05B
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Ream Caliper W / Volume Calc. Summary

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

FLORENCE COPPER

O-05B

Friday - June 16, 2017

Southwest Exploration Services, LLC
borehole geophysics and video services

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC
(480) 926-4558

Company: FLORENCE COPPER **Well Owner:**

County: PINAL **State:** Arizona **Country:** United States

Well Number: O-05B **Survey Date:** Friday - June 16, 2017 **Magnetic Declination:** Declination Correction Not Used

Field: FLORENCE COPPER **Drift Calculation Methodology:** Balanced Tangential Method

Location:

Remarks:

Witness: LAUREN - H & A **Vehicle No.:** 900 **Invoice No.:** **Operator:** A. OLSON **Well Depth:** 1220 Feet **Casing size:** 12.25 Inches

Tool: Compass - 6002 **Lat.:** **Long.:** **Sec.:** **Twp.:** **Rge.:**

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
0	0.54	240.32	0.00						
20	0.69	291.31	19.99	-0.003	-0.194	1.00	3.47	0.19' (2.28")	269.10
40	0.43	070.40	39.98	0.066	-0.235	0.41	7.55	0.24' (2.88")	285.60
60	0.20	021.21	59.97	0.124	-0.152	0.96	3.36	0.20' (2.40")	309.20
80	0.29	254.09	79.96	0.143	-0.188	0.84	7.22	0.24' (2.88")	307.20
100	0.29	321.51	99.96	0.169	-0.268	0.42	4.47	0.32' (3.84")	302.20
120	0.38	153.51	119.95	0.149	-0.270	0.13	8.02	0.31' (3.72")	298.90
140	0.37	220.23	139.94	0.040	-0.282	0.43	4.43	0.28' (3.36")	278.10
160	0.41	325.70	159.93	0.050	-0.364	0.83	6.42	0.37' (4.44")	277.80
180	0.11	165.42	179.92	0.091	-0.399	0.95	7.94	0.41' (4.92")	282.80
200	0.24	268.54	199.91	0.071	-0.436	0.37	6.31	0.44' (5.28")	279.30
220	0.31	231.63	219.90	0.036	-0.520	1.00	2.55	0.52' (6.24")	274.00
240	0.30	285.63	239.89	0.017	-0.613	1.00	3.66	0.61' (7.32")	271.50
260	0.38	254.52	259.88	0.013	-0.727	0.34	2.16	0.73' (8.76")	271.10
280	0.28	054.53	279.87	0.024	-0.751	0.93	7.94	0.75' (9.00")	271.80
300	0.26	309.51	299.86	0.081	-0.746	0.78	6.40	0.75' (9.00")	276.20
320	0.30	079.44	319.85	0.119	-0.730	0.53	7.30	0.74' (8.88")	279.30
340	0.37	084.67	339.84	0.135	-0.614	0.00	0.37	0.63' (7.56")	282.40

True Vertical Depth: 1219.41' **Final Drift Distance:** 1.01' (12.12") **Final Drift Bearing:** 42.70°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

O-05B

(480) 926-4558

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
360	0.41°	139.22°	359.83	0.087	-0.503	0.56	3.69	0.51' (6.12")	279.80
380	0.56°	130.67°	379.82	-0.031	-0.382	0.73	0.60	0.38' (4.56")	265.40
400	0.59°	180.38°	399.81	-0.198	-0.309	0.88	3.39	0.37' (4.44")	237.40
420	0.61°	197.07°	419.80	-0.403	-0.341	0.20	1.17	0.53' (6.36")	220.20
440	0.49°	213.11°	439.79	-0.576	-0.419	0.97	1.12	0.71' (8.52")	216.00
460	0.44°	257.93°	459.78	-0.664	-0.541	0.96	3.07	0.86' (10.32")	219.20
480	0.42°	270.01°	479.77	-0.680	-0.689	0.12	0.85	0.97' (11.64")	225.40
500	0.55°	314.26°	499.76	-0.613	-0.831	0.81	3.04	1.03' (12.36")	233.60
520	0.40°	355.86°	519.75	-0.476	-0.905	0.59	2.86	1.02' (12.24")	242.20
540	0.08°	067.24°	539.74	-0.401	-0.897	0.73	4.70	0.98' (11.76")	245.90
560	0.05°	281.95°	559.73	-0.394	-0.893	0.28	7.69	0.98' (11.76")	246.20
580	0.15°	119.59°	579.72	-0.405	-0.879	0.77	7.97	0.97' (11.64")	245.30
600	0.45°	117.54°	599.71	-0.454	-0.787	0.49	0.15	0.91' (10.92")	240.00
620	0.66°	117.62°	619.70	-0.544	-0.615	0.69	0.02	0.82' (9.84")	228.50
640	0.73°	126.56°	639.69	-0.673	-0.411	0.13	0.63	0.79' (9.48")	211.40
660	0.83°	146.08°	659.68	-0.869	-0.228	0.83	1.37	0.90' (10.80")	194.70
680	0.41°	202.36°	679.67	-1.055	-0.174	0.80	3.80	1.07' (12.84")	189.40
700	0.11°	272.70°	699.66	-1.120	-0.220	0.25	4.64	1.14' (13.68")	191.10
720	0.19°	292.86°	719.65	-1.106	-0.270	0.54	1.41	1.14' (13.68")	193.70
740	0.01°	109.21°	739.64	-1.094	-0.299	0.24	8.06	1.13' (13.56")	195.30
760	0.49°	347.57°	759.63	-1.011	-0.316	0.94	7.04	1.06' (12.72")	197.30
780	0.59°	006.33°	779.62	-0.825	-0.323	0.65	1.31	0.89' (10.68")	201.40
800	0.76°	026.18°	799.61	-0.604	-0.253	0.97	1.39	0.65' (7.80")	202.80
820	0.70°	039.12°	819.60	-0.390	-0.117	0.06	0.91	0.41' (4.92")	196.70
840	0.75°	049.47°	839.59	-0.210	0.060	0.29	0.73	0.22' (2.64")	164.20
860	0.52°	120.43°	859.58	-0.171	0.238	0.57	4.68	0.29' (3.48")	125.70
880	0.62°	149.39°	879.57	-0.310	0.371	0.47	2.02	0.48' (5.76")	129.90
900	0.52°	177.37°	899.56	-0.494	0.430	0.42	1.95	0.65' (7.80")	138.90
920	0.51°	222.69°	919.55	-0.650	0.374	0.69	3.11	0.75' (9.00")	150.10
940	0.16°	007.18°	939.54	-0.688	0.317	0.04	7.68	0.76' (9.12")	155.20
960	0.26°	155.49°	959.53	-0.702	0.339	0.30	7.76	0.78' (9.36")	154.20
980	0.36°	167.42°	979.52	-0.805	0.372	0.98	0.84	0.89' (10.68")	155.20
1,000	0.30°	149.62°	999.52	-0.911	0.412	0.95	1.25	1.00' (12.00")	155.70

True Vertical Depth: 1219.41' **Final Drift Distance: 1.01' (12.12")** **Final Drift Bearing: 42.70°**

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

O-05B

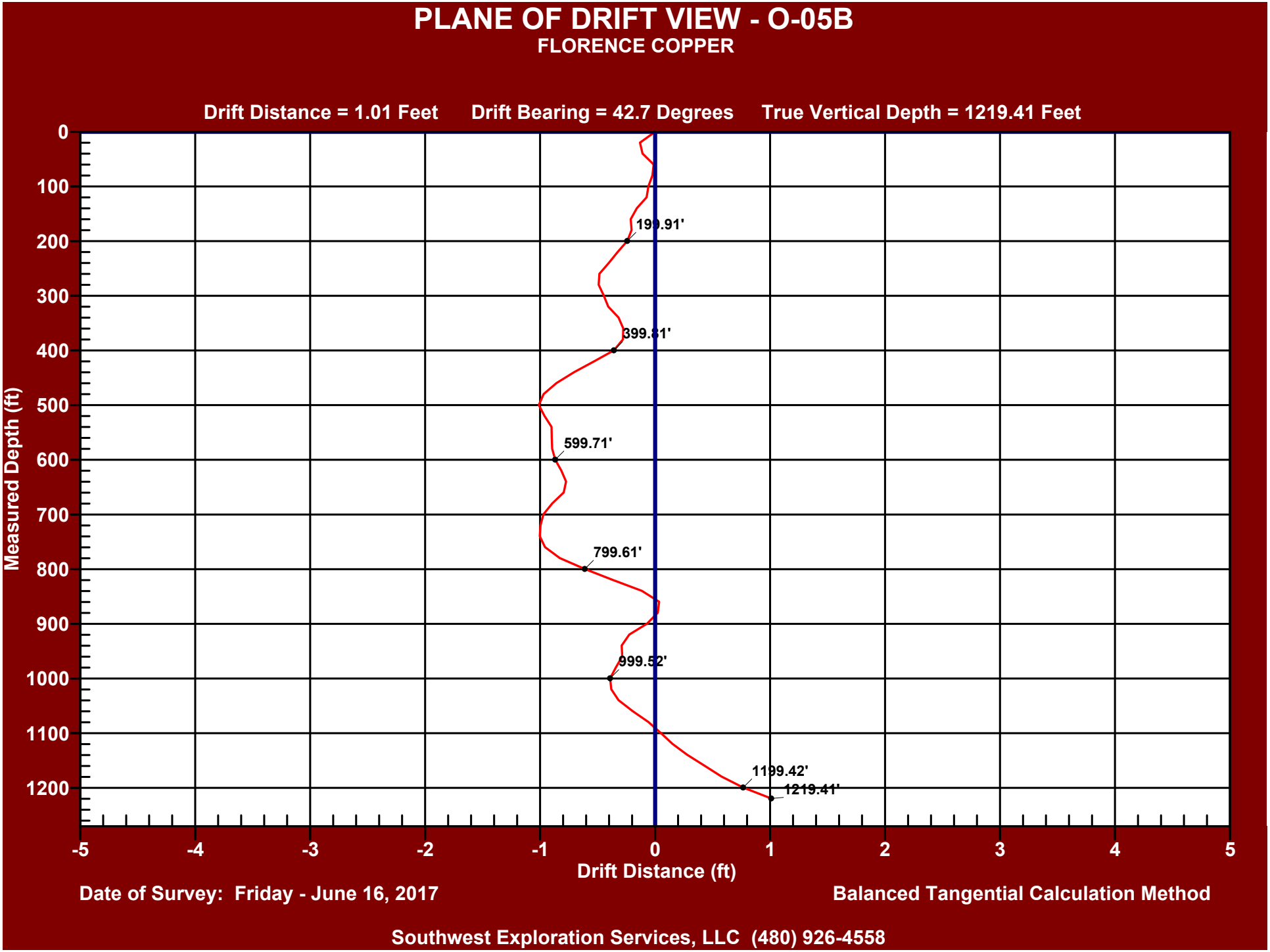
(480) 926-4558

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
1,020	0.15°	019.21°	1,019.51	-0.931	0.447	0.96	7.32	1.03' (12.36")	154.40
1,040	0.28°	010.16°	1,039.50	-0.858	0.464	0.46	0.64	0.98' (11.76")	151.60
1,060	0.73°	351.16°	1,059.49	-0.684	0.453	0.25	1.33	0.82' (9.84")	146.50
1,080	0.57°	347.62°	1,079.48	-0.461	0.412	0.92	0.25	0.62' (7.44")	138.20
1,100	0.59°	341.97°	1,099.47	-0.266	0.359	0.09	0.40	0.45' (5.40")	126.50
1,120	0.45°	355.58°	1,119.46	-0.090	0.321	0.16	0.96	0.33' (3.96")	105.60
1,140	0.63°	352.89°	1,139.45	0.097	0.301	0.98	0.19	0.32' (3.84")	072.10
1,160	0.56°	009.24°	1,159.44	0.303	0.303	0.54	1.15	0.43' (5.16")	045.00
1,180	0.42°	036.32°	1,179.43	0.459	0.362	0.80	1.89	0.58' (6.96")	038.30
1,200	0.67°	029.54°	1,199.42	0.620	0.463	0.66	0.48	0.77' (9.24")	036.80
1,220	0.97°	082.19°	1,219.41	0.745	0.688	0.94	3.57	1.01' (12.12")	042.70

True Vertical Depth: 1219.41'

Final Drift Distance: 1.01' (12.12")

Final Drift Bearing: 42.70°

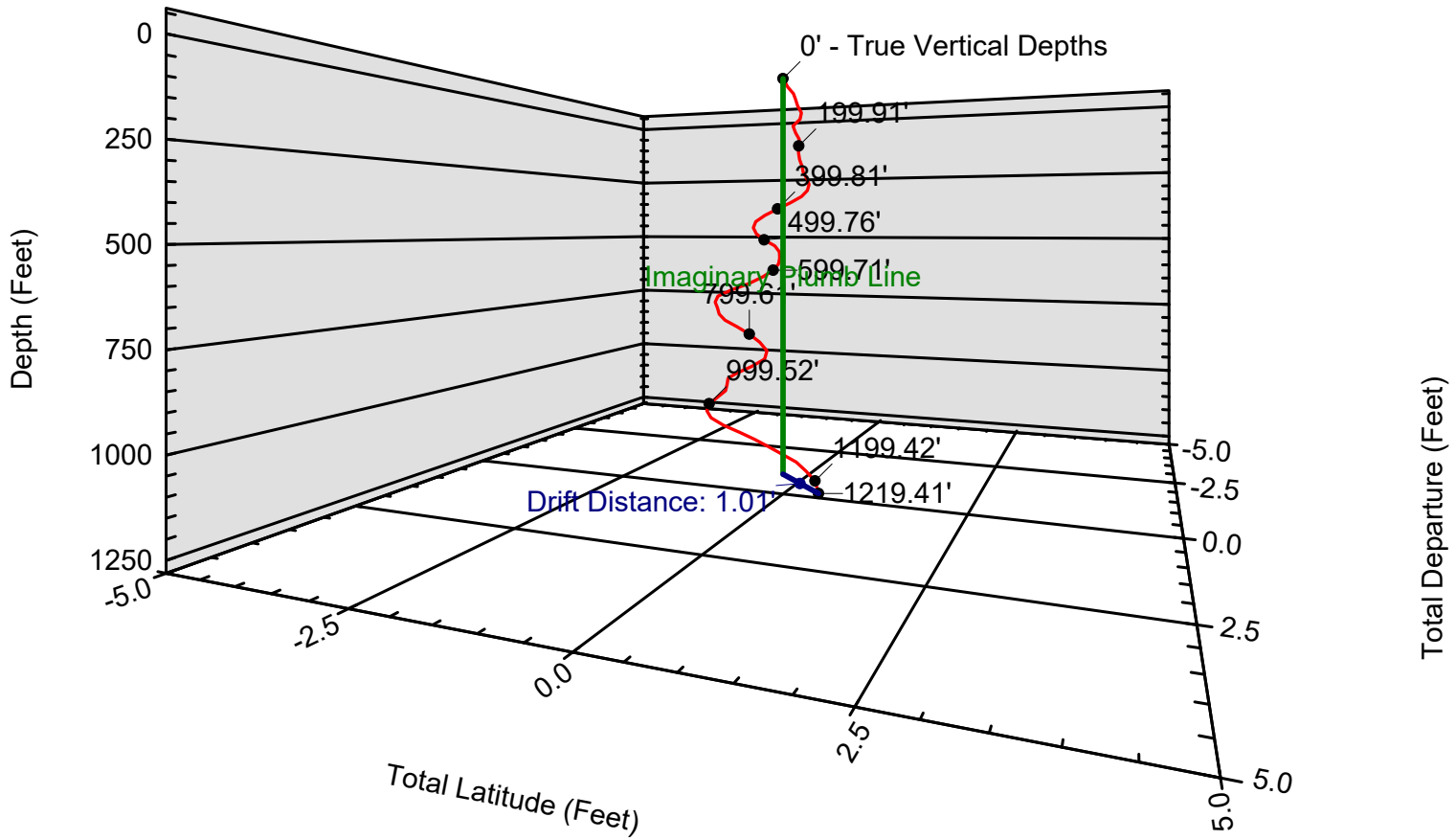

PLANE OF DRIFT VIEW - O-05B
FLORENCE COPPER
Drift Distance = 1.01 Feet
Drift Bearing = 42.7 Degrees
True Vertical Depth = 1219.41 Feet
Measured Depth (ft)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
199.91'
399.81'
599.71'
799.61'
999.52'
1199.42'
1219.41'
-5
-4
-3
-2
-1
0
1
2
3
4
5
Drift Distance (ft)
Date of Survey: Friday - June 16, 2017
Balanced Tangential Calculation Method
Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - O-05B

FLORENCE COPPER

Drift Distance = 1.01 Feet **Drift Bearing = 42.7 Degrees** **True Vertical Depth = 1219.41 Feet**

291.0



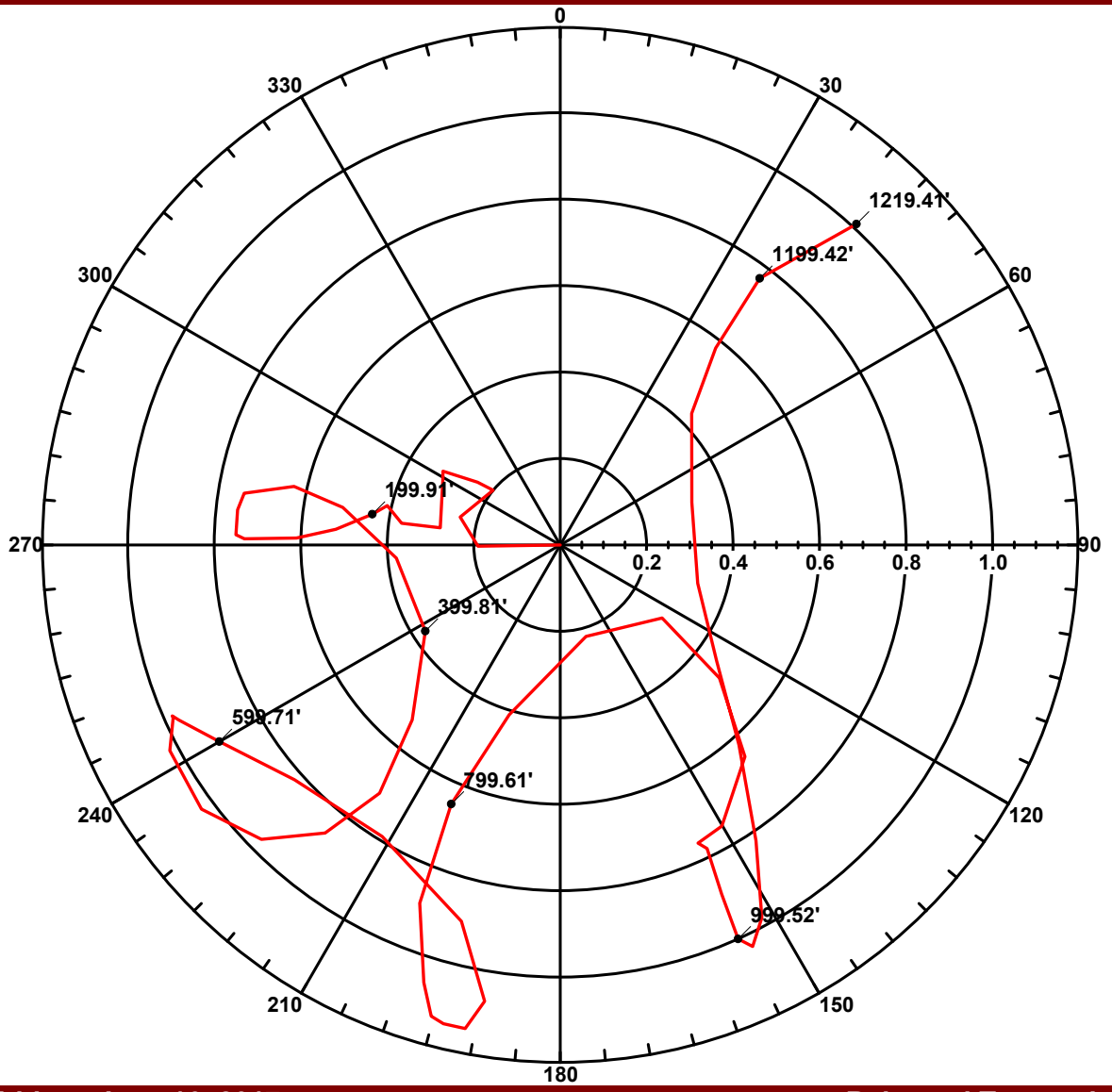
Date of Survey: Friday - June 16, 2017 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - O-05B

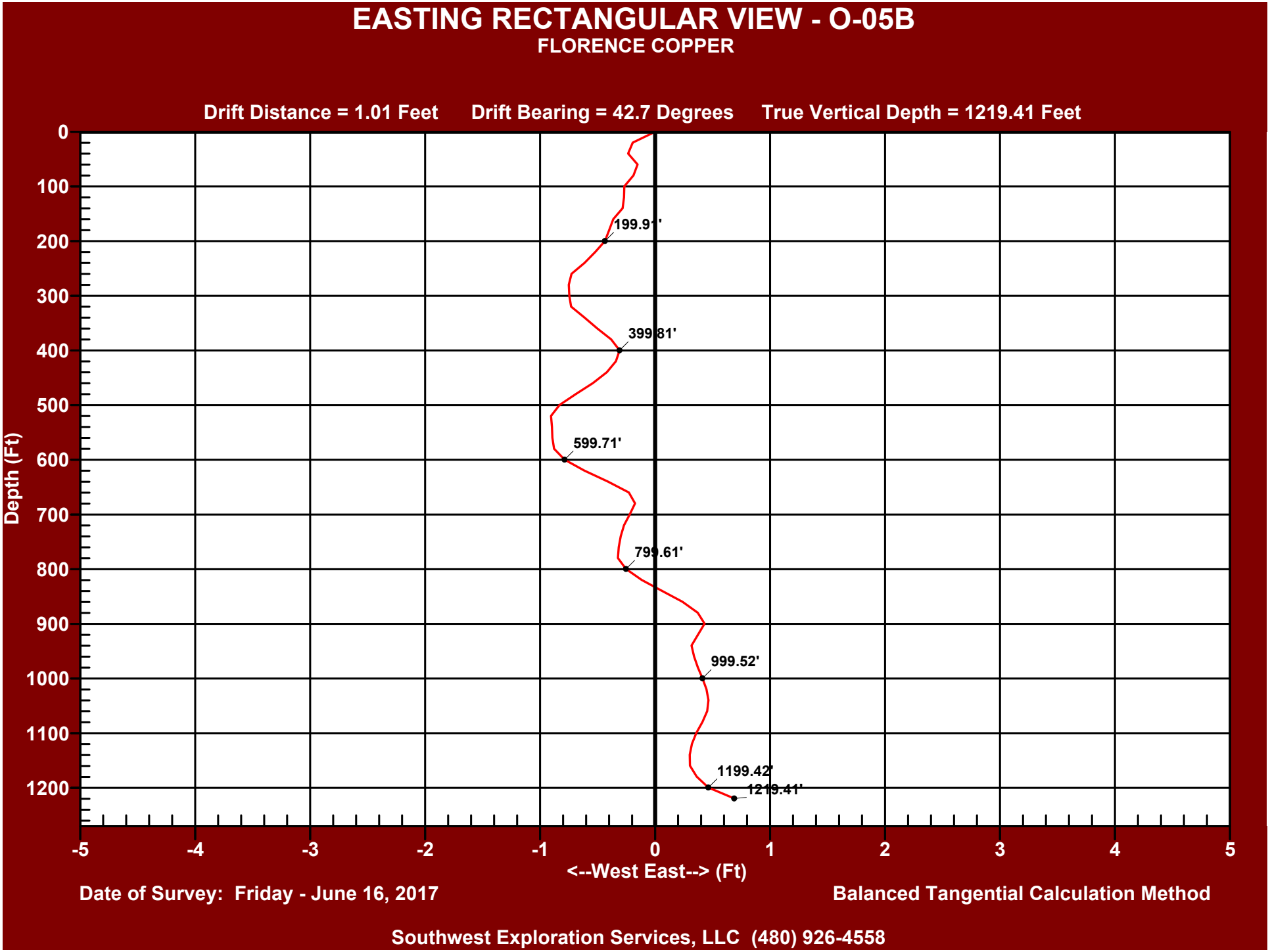
FLORENCE COPPER

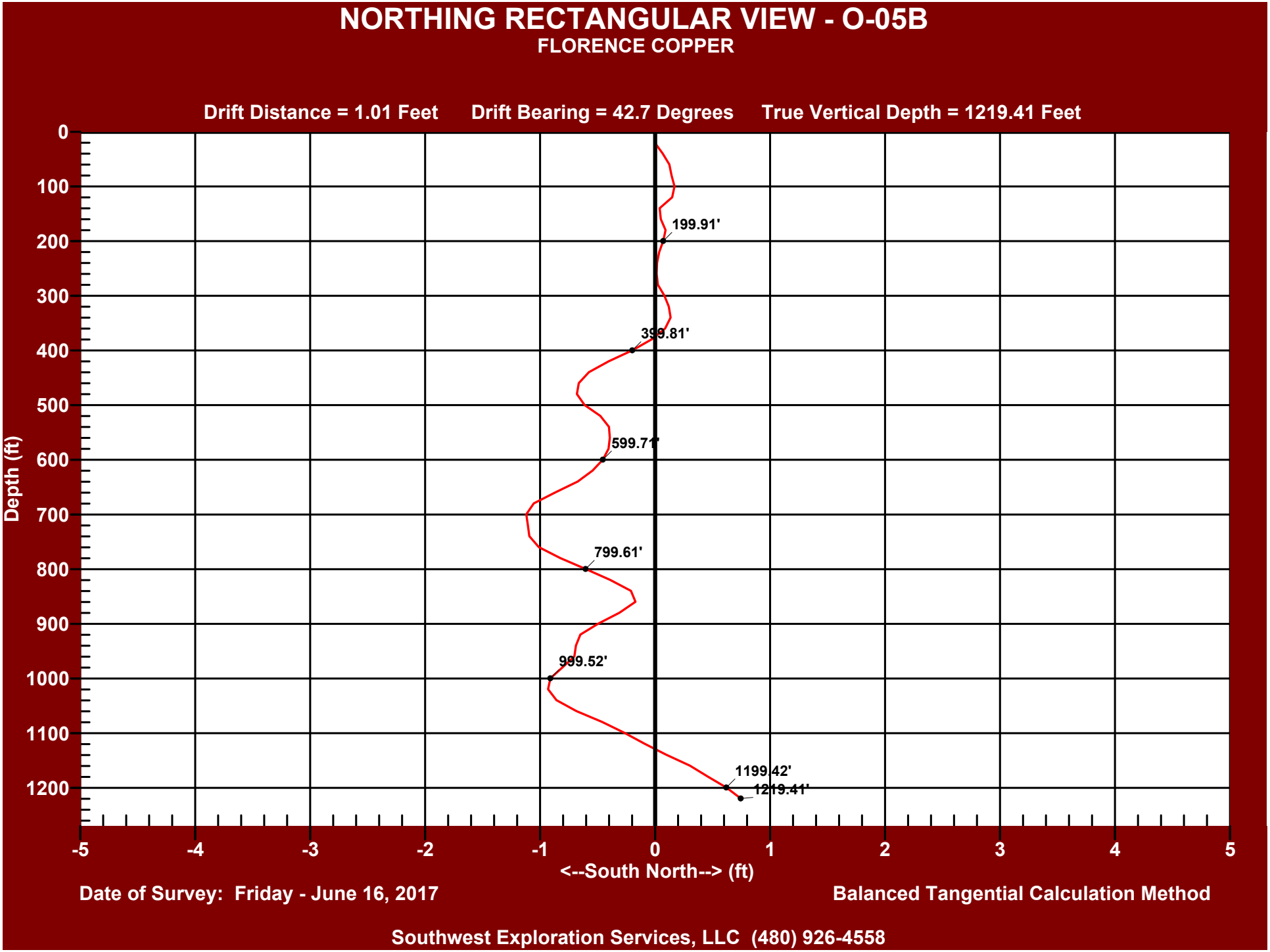
Drift Distance = 1.01 Feet Drift Bearing = 42.7 Degrees True Vertical Depth = 1219.41 Feet



Date of Survey: Friday - June 16, 2017 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558


EASTING RECTANGULAR VIEW - O-05B
FLORENCE COPPER
Drift Distance = 1.01 Feet
Drift Bearing = 42.7 Degrees
True Vertical Depth = 1219.41 Feet
Depth (Ft)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
199.91'
399.81'
599.71'
799.61'
999.52'
1199.42'
1219.41'
-5
-4
-3
-2
-1
0
1
2
3
4
5
<--West East--> (Ft)
Date of Survey: Friday - June 16, 2017
Balanced Tangential Calculation Method
Southwest Exploration Services, LLC (480) 926-4558


NORTHING RECTANGULAR VIEW - O-05B
FLORENCE COPPER
Drift Distance = 1.01 Feet
Drift Bearing = 42.7 Degrees
True Vertical Depth = 1219.41 Feet
Depth (ft)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
199.91'
399.81'
599.71'
799.61'
999.52'
1199.42'
1219.41'
-5
-4
-3
-2
-1
0
1
2
3
4
5
<--South North--> (ft)
Date of Survey: Friday - June 16, 2017
Balanced Tangential Calculation Method
Southwest Exploration Services, LLC (480) 926-4558

APPENDIX F

Cement Bond Log Summary

WELL O-05B

Geophysical Log Summary

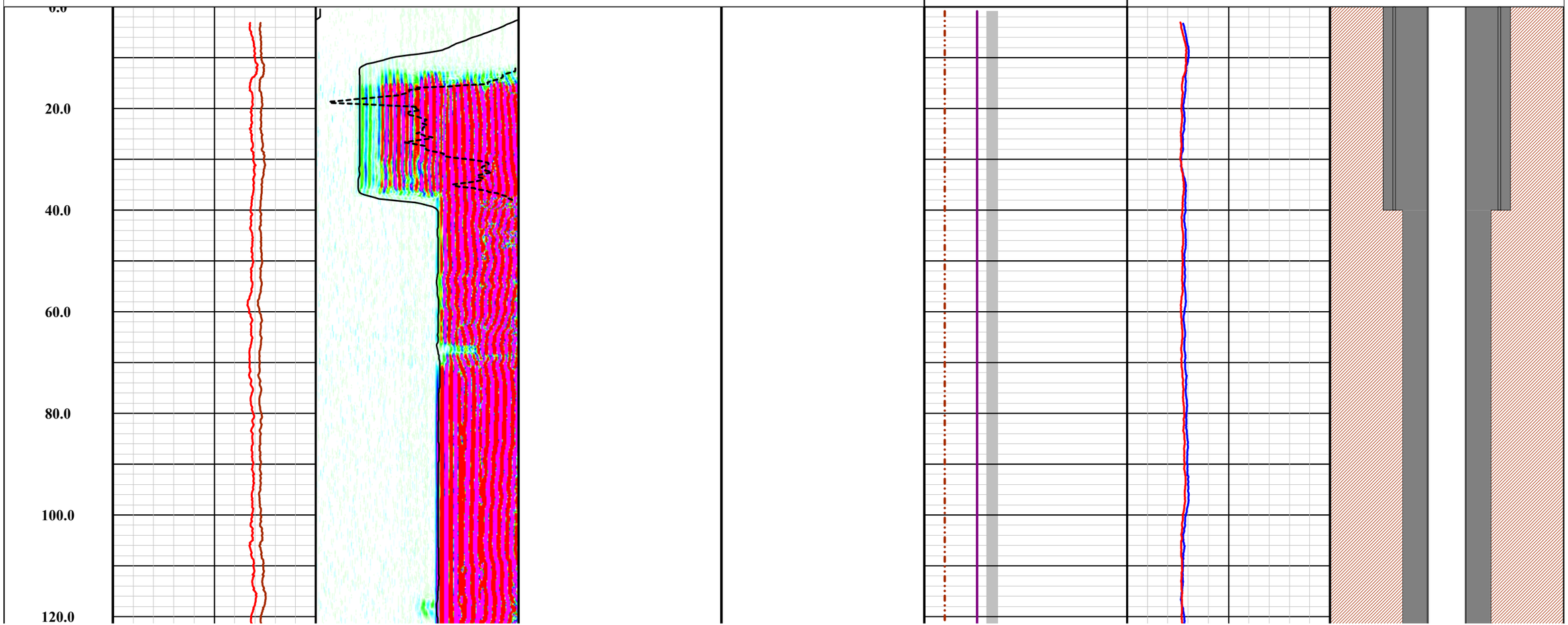
COMPANY:	FLORENCE COPPER COMPANY	Logging Engineer:	K. MITCHELL
FIELD:	FLORENCE COPPER SITE	Date Logged:	12-03-17
WELL ID:	O-05B	Processed By:	K.M / B.C.
COUNTY:	PINAL STATE: ARIZONA	Date Processed:	09-13-18

Southwest Exploration Services, LLC
borehole geophysics & video services

HALEY ALDRICH

O-05B (Replacement Well) Sonic with Density Cement Evaluation

Depth 1in:20ft	Comp Density Cased 7-19-17 -1 g/cc 3	RX1 - VDL (60mm) Open 6-16-17 100 uSec 1000	RX1 - VDL Cased 7-19-17 100 uSec 1020	RX4 - VDL Cased 7-19-17 100 uSec 1020	Velocity Anal Cased 7-19-17 40 us/ft 220	Near Density Cased 7-19-17 1 g/cc 4	Well Design
	Compensation Cased 7-19-17 -3 g/cc 1	RX1 - TT (60mm) Open 6-16-17 100 uSec 1000	RX1 - TT Cased 7-19-17 100 1020	RX4 - TT Cased 7-19-17 100 1020	P-Wave Slow Cased 7-19-17 40 us/ft 220	Far Density Cased 7-19-17 1 g/cc 4	
		Bond Index Cased 6-16-17 0 % 100			Steel 40 us/ft 220	4 Pi Density (Dry) Cased 7-19-17 1000 CPS 900	
					FRP 40 us/ft 220	4 Pi Density (Wet) Cased 7-19-17 300 CPS 0	
					Cement		



140.0

160.0

180.0

200.0

220.0

240.0

260.0

280.0

300.0

320.0

340.0

Fluid Level ~229.8'

360.0

380.0

400.0

420.0

440.0

Adapter
PVC to FRP ~450.8'

460.0

480.0

Top of Sch 80 PVC
Screen ~452'

500.0

Version 8-12-18, RECC

				Cement	300 CPS 0	
					Cased 7-19-17	
				40 us/ft 220	4 Pi Density (Wet)	
	0 % 100			FRP	1000 CPS 900	
	Cased 6-16-17			40 us/ft 220	Cased 7-19-17	
	Bond Index			Steel	4 Pi Density (Dry)	
-3 g/cc 1	100 uSec 1000	100 1020	100 1020	40 us/ft 220	1 g/cc 4	
Cased 7-19-17	Open 6-16-17	Cased 7-19-17	Cased 7-19-17	Cased 7-19-17	Cased 7-19-17	
Compensation	RX1 - TT (60mm)	RX1 - TT	RX4 - TT	P-Wave Slow	Far Density	

	-1 g/cc 3 Cased 7-19-17 **Comp Density**	100 uSec 1000 Open 6-16-17 **RX1 - VDL (60mm)**	100 uSec 1020 Cased 7-19-17 **RX1 - VDL**	100 uSec 1020 Cased 7-19-17 **RX4 - VDL**	40 us/ft 220 Cased 7-19-17 **Velocity Anal**	1 g/cc 4 Cased 7-19-17 **Near Density**	**Well Design**
1in:20ft **Depth**	**O-05B (Replacement Well) Sonic with Density Cement Evaluation**						

APPENDIX G

SAPT Documentation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STANDARD ANNULAR PRESSURE TEST

Operator FLORENCE COPPER, INC
Address 1575 W. HUNT HWY
FLORENCE, AZ 85132
Well Name O-05B

State Permit No. P-101704
USEPA Permit No. R9UIC-AZ3-FY11-1
Date of Test 8/8/2017
Well Type CLASS III OBSERVATION

LOCATION INFORMATION SE Quarter of the NW Quarter of the SW Quarter of Section 28; Range 9E; Township 4S; County PINAL;

Company Representative IAN REAM; Field Inspector LAUREN CANDREVA;

Type of Pressure Gauge Pressure transducer with data logger inch face; 300 psi full scale; 0.001 psi increments;

New Gauge? Yes ☑ No ☐ If no, date of calibration ____ Calibration certification submitted? Yes ☐ No ☑

TEST RESULTS
Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.
For Class II wells, annulus pressue should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.
Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes ☐ No ☑
2-year test for TA'd wells on time? Yes ☐ No ☑
After rework? Yes ☐ No ☑
Newly permitted well? Yes ☑ No ☐

Pressure (in psig)

Time	Annulus	Tubing
12:48	119.12	same
12:58	118.63	same
13:08	118.19	same
13:18	117.83	same

Casing size 5" - NOMINAL
Tubing size 2"
Packer type INFLATABLE PACKER
Packer set @ 411.88
Top of Permitted Injection Zone 424
Is packer 100 ft or less above top of Injection Zone ? Yes ☑ No ☐
If not, please submit a justification.
Fluid return (gal.) 0.69
Comments: Two tests were completed to confirm results, the data for both tests is attached in chart and table

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.05 5.96 psi
Test Period Pressure change 1.29 psi

Test Passed ☑ Test Failed ☐

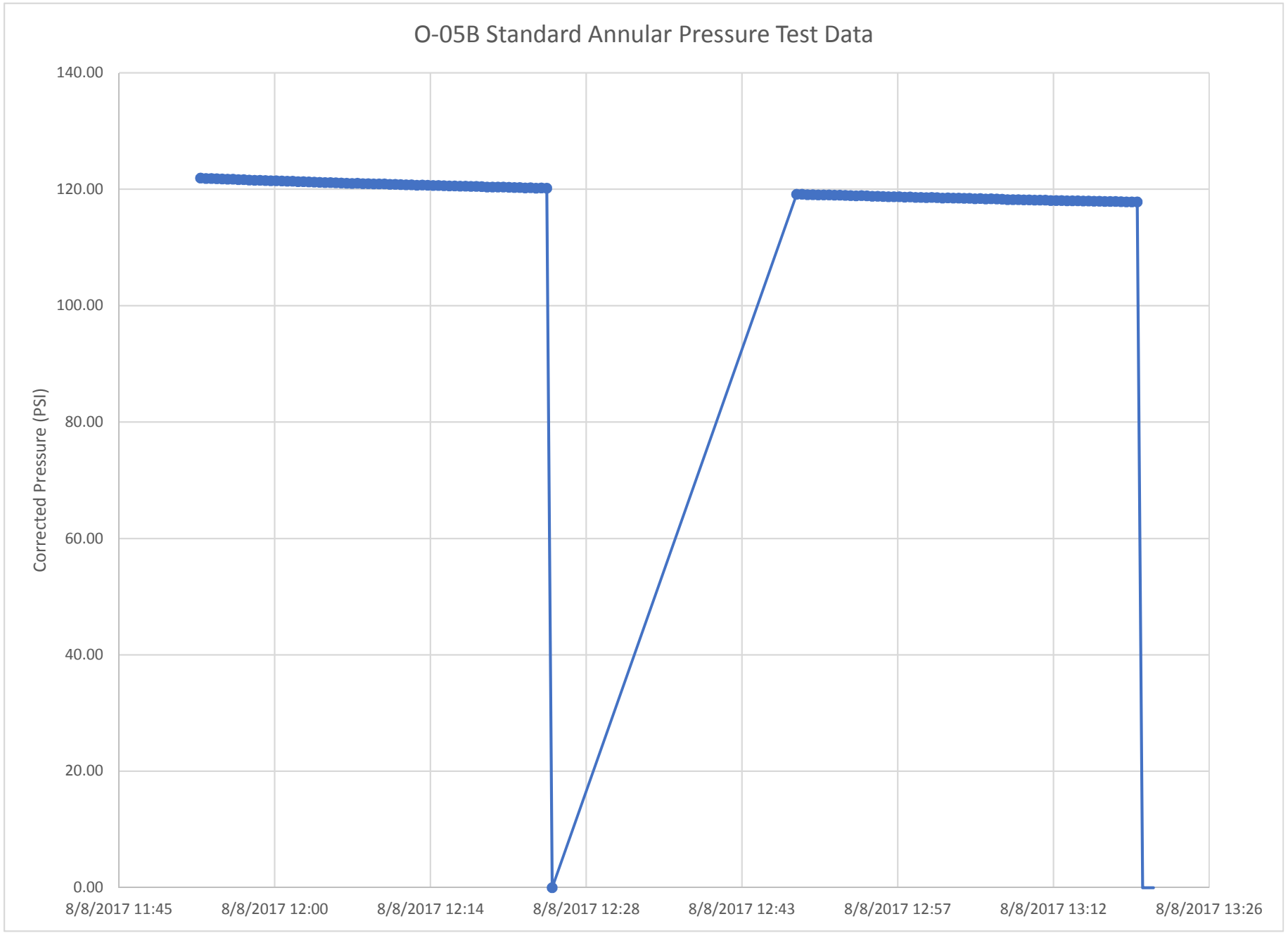
If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

IAN REAM
Printed Name of Company Representative

Signature of Company Representative

9-14-2018
Date


O-05B Standard Annular Pressure Test Data
Corrected Pressure (PSI)
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
8/8/2017 11:45
8/8/2017 12:00
8/8/2017 12:14
8/8/2017 12:28
8/8/2017 12:43
8/8/2017 12:57
8/8/2017 13:12
8/8/2017 13:26

Well O-05B SAPT Data		
Transducer Serial Number:	519257	
Tranducer Model Number:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Pressure (PSI) (Sensor pressure - barometric pressure)
8/8/2017 11:53	135.79	121.91
8/8/2017 11:53	135.727	121.85
8/8/2017 11:54	135.713	121.83
8/8/2017 11:54	135.675	121.80
8/8/2017 11:55	135.638	121.76
8/8/2017 11:55	135.589	121.71
8/8/2017 11:56	135.582	121.70
8/8/2017 11:56	135.531	121.65
8/8/2017 11:57	135.51	121.63
8/8/2017 11:57	135.454	121.58
8/8/2017 11:58	135.421	121.54
8/8/2017 11:58	135.416	121.54
8/8/2017 11:59	135.37	121.49
8/8/2017 11:59	135.32	121.44
8/8/2017 12:00	135.337	121.46
8/8/2017 12:00	135.29	121.41
8/8/2017 12:01	135.238	121.36
8/8/2017 12:01	135.231	121.35
8/8/2017 12:02	135.174	121.30
8/8/2017 12:02	135.161	121.28
8/8/2017 12:03	135.128	121.25
8/8/2017 12:03	135.082	121.20
8/8/2017 12:04	135.066	121.19
8/8/2017 12:04	135.032	121.15
8/8/2017 12:05	135.01	121.13
8/8/2017 12:05	134.971	121.09
8/8/2017 12:06	134.951	121.07
8/8/2017 12:06	134.901	121.02
8/8/2017 12:07	134.878	121.00
8/8/2017 12:07	134.892	121.01
8/8/2017 12:08	134.833	120.95
8/8/2017 12:08	134.839	120.96
8/8/2017 12:09	134.782	120.90
8/8/2017 12:09	134.774	120.90
8/8/2017 12:10	134.768	120.89
8/8/2017 12:10	134.709	120.83
8/8/2017 12:11	134.696	120.82
8/8/2017 12:11	134.658	120.78
8/8/2017 12:12	134.634	120.76
8/8/2017 12:12	134.635	120.76
8/8/2017 12:13	134.572	120.69

Well O-05B SAPT Data		
Transducer Serial Number:	519257	
Tranducer Model Number:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Pressure (PSI) (Sensor pressure - barometric pressure)
8/8/2017 12:13	134.578	120.70
8/8/2017 12:14	134.55	120.67
8/8/2017 12:14	134.533	120.65
8/8/2017 12:15	134.518	120.64
8/8/2017 12:15	134.473	120.59
8/8/2017 12:16	134.442	120.56
8/8/2017 12:16	134.442	120.56
8/8/2017 12:17	134.403	120.52
8/8/2017 12:17	134.381	120.50
8/8/2017 12:18	134.374	120.50
8/8/2017 12:18	134.352	120.47
8/8/2017 12:19	134.306	120.43
8/8/2017 12:19	134.263	120.38
8/8/2017 12:20	134.24	120.36
8/8/2017 12:20	134.24	120.36
8/8/2017 12:21	134.252	120.37
8/8/2017 12:21	134.221	120.34
8/8/2017 12:22	134.164	120.29
8/8/2017 12:22	134.16	120.28
8/8/2017 12:23	134.109	120.23
8/8/2017 12:23	134.145	120.27
8/8/2017 12:24	134.068	120.19
8/8/2017 12:24	134.073	120.19
8/8/2017 12:25	134.042	120.16
8/8/2017 12:25	13.879	0.00
8/8/2017 12:48	133.003	119.12
8/8/2017 12:48	133.003	119.12
8/8/2017 12:49	132.937	119.06
8/8/2017 12:49	132.918	119.04
8/8/2017 12:50	132.906	119.03
8/8/2017 12:50	132.898	119.02
8/8/2017 12:51	132.876	119.00
8/8/2017 12:51	132.862	118.98
8/8/2017 12:52	132.849	118.97
8/8/2017 12:52	132.8	118.92
8/8/2017 12:53	132.764	118.89
8/8/2017 12:53	132.744	118.87
8/8/2017 12:54	132.771	118.89
8/8/2017 12:54	132.724	118.85
8/8/2017 12:55	132.672	118.79
8/8/2017 12:55	132.646	118.77

Well O-05B SAPT Data		
Transducer Serial Number:	519257	
Tranducer Model Number:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Pressure (PSI) (Sensor pressure - barometric pressure)
8/8/2017 12:56	132.613	118.73
8/8/2017 12:56	132.591	118.71
8/8/2017 12:57	132.593	118.71
8/8/2017 12:57	132.579	118.70
8/8/2017 12:58	132.51	118.63
8/8/2017 12:58	132.539	118.66
8/8/2017 12:59	132.479	118.60
8/8/2017 12:59	132.471	118.59
8/8/2017 13:00	132.446	118.57
8/8/2017 13:00	132.464	118.59
8/8/2017 13:01	132.44	118.56
8/8/2017 13:01	132.358	118.48
8/8/2017 13:02	132.392	118.51
8/8/2017 13:02	132.363	118.48
8/8/2017 13:03	132.356	118.48
8/8/2017 13:03	132.33	118.45
8/8/2017 13:04	132.298	118.42
8/8/2017 13:04	132.249	118.37
8/8/2017 13:05	132.267	118.39
8/8/2017 13:05	132.214	118.34
8/8/2017 13:06	132.217	118.34
8/8/2017 13:06	132.189	118.31
8/8/2017 13:07	132.153	118.27
8/8/2017 13:07	132.087	118.21
8/8/2017 13:08	132.069	118.19
8/8/2017 13:08	132.081	118.20
8/8/2017 13:09	132.053	118.17
8/8/2017 13:09	132.037	118.16
8/8/2017 13:10	132.014	118.14
8/8/2017 13:10	132.016	118.14
8/8/2017 13:11	132.004	118.13
8/8/2017 13:11	131.944	118.07
8/8/2017 13:12	131.943	118.06
8/8/2017 13:12	131.926	118.05
8/8/2017 13:13	131.898	118.02
8/8/2017 13:13	131.871	117.99
8/8/2017 13:14	131.878	118.00
8/8/2017 13:14	131.839	117.96
8/8/2017 13:15	131.832	117.95
8/8/2017 13:15	131.82	117.94
8/8/2017 13:16	131.808	117.93

Well O-05B SAPT Data		
Transducer Serial Number:	519257	
Tranducer Model Number:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Pressure (PSI) (Sensor pressure - barometric pressure)
8/8/2017 13:16	131.785	117.91
8/8/2017 13:17	131.752	117.87
8/8/2017 13:17	131.756	117.88
8/8/2017 13:18	131.735	117.86
8/8/2017 13:18	131.708	117.83
8/8/2017 13:19	131.706	117.83
8/8/2017 13:19	131.688	117.81
8/8/2017 13:20	13.871	-0.01
8/8/2017 13:20	13.862	-0.02
8/8/2017 13:21	13.875	0.00

APPENDIX H

Well Development Field Forms

PUMPING TEST/DEVELOPMENT
FIELD DATA LOG

Project Name: FCI	Project No.: 129687
Well No.: O-05B	Date: 6/22/17
Location: FLORENCE, AZ	Measuring Point:
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls):
Pump Setting (ft bls): 1180	Pump Type: AIR LIFT
How Q Measured: VOLUME OF CONTAINER	Personnel: C. GAUSE

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ml/L)	pH	Sp. Cond. (mmhos/cm)	Temp. °F	Comments
0700	~50			0.1				BROWN / MUD
0730	60-70			0.1				light BROWN
745	"			~0.1				LIGHT BROWN
800								AIRLIFT OFF TO ADJUST GEAR
815								AIRLIFT ON
815				0.1				BROWN / MUD
830				<0.1				LIGHT BROWN / CLOUDY
1030				0				CLEAR NTU 12.7
1145				0				CLEAR NTU 11.0
1215				0				CLEAR NTU 8.54
1315 NS				0				CLEAR NTU 7.49
1315	↓							AIRLIFT OFF
6/23 800				NA				AIR LIFT ON
800	60-70			1.5				LIGHT BROWN
815								BROWN / MUD
830				<0.1				light Brown / MUD
845				<0.1				light Brown / Cloudy
900				<0.1				CLOUDY
920				<0.1				Cloudy / Milky NTU 46.7
1010				0				Cloudy / Clear NTU 34.8
1045				0				CLEAR NTU 29.2
1130				0				CLEAR NTU 12.0
1200								END AIR LIFT

Additional Comments: INJECTED AQUA CLEAR AND SWABBED 6/22/17

PUMPING TEST/DEVELOPMENT
FIELD DATA LOG

Project Name: FCI	Project No.: 129687
Well No.: C-05 B	Date: 6-27-17
Location: FLORENCE, AZ	Measuring Point: TOC
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls):
Pump Setting (ft bls): 1195	Pump Type: GRUNDFOS
How Q Measured: BUCKET / STOPWATCH	Personnel: C. GUEST

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ml/L)	pH	Sp. Cond. (mmhos/cm)	Temp. °F	Comments	NTU
945		262.25							
950				0.1				START PUMPING	
1000	43 gpm	268.50		2.0	6.74	879	31.6	CLOUDY	46.8
1015	43 gpm	274.35		<0.1	7.27	1051	30.2	CLOUDY	204
1030	43	274.75		<0.1	7.28	1058	30.0	MICKY/CLOUDY	54.7
1100	43	275.40		<0.1	7.32	1085	30.2	CLEAR	5.58
1215	43	276.21		<0.1	7.32	1091	30.2	CLEAR	4.77
1230	43	276.30		0	7.32	1094	29.9	CLEAR	1.83
1310	43	276.41		0	7.34	1093	30.1	CLEAR	2.18
1340	43	276.5		0				CLEAR	1.41
1430	43	276.6		0				CLEAR	1.19
1510	43	276.6		0	7.24	1092	30.8	CLEAR	0.96
1625	43	276.4		0	7.21	1091	30.6	CLEAR	0.59
1750	43	276.5		0	7.23	1091	30.1	CLEAR	0.5
1815								PUMP OFF	
555								PUMP ON	30.2
600	43			0				CLEAR	30.2
705	43			0	7.25	1059	29.1	CLEAR	8.96
745	43			0	7.24	1083	29.3	CLEAR	0.73
750								PUMP OFF	

6-28

Additional Comments:
1540 YSI BATTERIES DEAD
1510 NEW BATTERIES

APPENDIX I

Well Video Log

Southwest Exploration Services, LLC
borehole geophysics & video services

Southwest Exploration Services, LLC

25811 S. Arizona Avenue Chandler, AZ. 85248

Phone: (480) 926-4558 Fax: (480) 926-4579 Web: www.swexp.com

Client: Florence Copper | Survey Date: July 19, 2017

Address: | Invoice: | Run: 1

City: | Country: | **Well Name:** O-05B

Requested By: Florence / H&A | P.O.: | **Well Owner:**

Copy To: | Camera:

Purpose: General Inspection | Zero Datum: Top of Casing

Location: | Depth: | Vehicle: 310

Field: Florence Copper

1st Csg.O.D. | Csg Weight: | From: | To: | 2nd Csg.O.D. | Csg Weight: | From: | To:

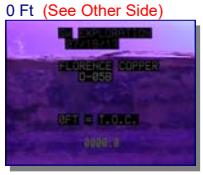
Standing Water Level: | Pumping Water Level: | Pump Depth: | O.D.Ref.: Measured | Casing Buildup: None

Operator: A. Olson | Lat.: | Long.: | Sec: | Twp: | Rge:

Other Information:

Wellbore Snapshots

0 Ft (See Other Side)



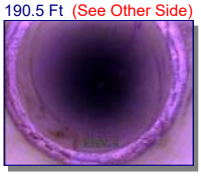
23.1 Ft (See Other Side)

44.8 Ft (See Other Side)

132.5 Ft (See Other Side)

133.3 Ft (See Other Side)

190.5 Ft (See Other Side)

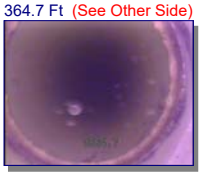


230.3 Ft (See Other Side)

235.3 Ft (See Other Side)

322.7 Ft (See Other Side)

364.7 Ft (See Other Side)



394.5 Ft (See Other Side)

449.8 Ft (See Other Side)

True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
0	Top of well. Zero Point at the top of casing
23.1	Downhole view of well
44.8	Side scan of casing joint
132.5	Side scan of casing joint
133.3	Downhole view of well - casing appears in good condition
190.5	Downhole view of casing joint
230.3	Downhole view of SWL ~231 FT
235.3	Downhole view below SWL - visibility poor
322.7	Downhole view - still very murky, poor visibility
364.7	Downhole view of casing - visibility slightly improved from above
394.5	Side scan of casing joint
449.8	Downhole view - water column becoming progressively clearer with depth

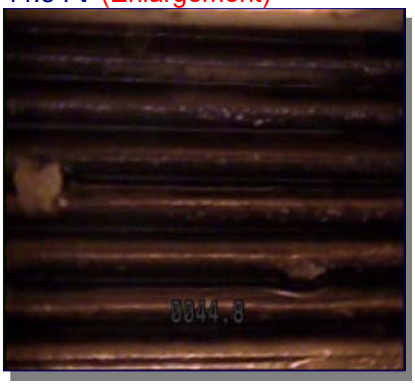
Notes:

12 WELLBORE SHAPSHOTS

0 Ft (Enlargement)

23.1 Ft (Enlargement)

44.8 Ft (Enlargement)



132.5 Ft (Enlargement)

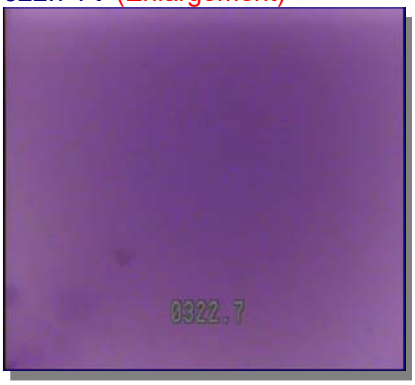
133.3 Ft (Enlargement)

190.5 Ft (Enlargement)

230.3 Ft (Enlargement)

235.3 Ft (Enlargement)

322.7 Ft (Enlargement)



364.7 Ft (Enlargement)

394.5 Ft (Enlargement)

449.8 Ft (Enlargement)

Southwest Exploration Services, LLC

borehole geophysics & video services

Southwest Exploration Services, LLC

25811 S. Arizona Avenue Chandler, AZ. 85248

Phone: (480) 926-4558 Fax: (480) 926-4579 Web: www.swexp.com

Client: Florence Copper | Survey Date: July 19, 2017

Address: | Invoice: | Run: 1

City: | Country: | **Well Name:** O-05B

Requested By: Florence / H&A | P.O.: | **Well Owner:**

Copy To: | Camera:

Purpose: General Inspection | Zero Datum: Top of Casing

Location: | Depth: | Vehicle: 310

Field: Florence Copper

1st Csg.O.D. | Csg Weight: | From: | To: | 2nd Csg.O.D. | Csg Weight: | From: | To:

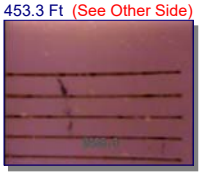
Standing Water Level: | Pumping Water Level: | Pump Depth: | O.D.Ref.: Measured | Casing Buildup: None

Operator: A. Olson | Lat.: | Long.: | Sec: | Twp: | Rge:

Other Information:

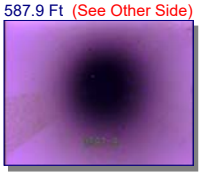
Wellbore Snapshots

451.8 Ft (See Other Side) 453.3 Ft (See Other Side)

483.3 Ft (See Other Side) 571.2 Ft (See Other Side)

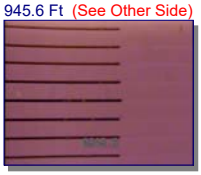

583.8 Ft (See Other Side) 587.9 Ft (See Other Side)

684.3 Ft (See Other Side) 721.2 Ft (See Other Side)


804.7 Ft (See Other Side) 860.2 Ft (See Other Side)


904.8 Ft (See Other Side) 945.6 Ft (See Other Side)

True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
451.8	Downhole view of casing joint and top of peroration - good water clarity here
453.3	Top of perforations - side scan
483.3	Side scan of casing joint
571.2	Downhole view of well - good visibility - perfs hard to see but all open and not clogged
583.8	Side scan of casing joint
587.9	Downhole view of perfs - very minor buildup on perforations
684.3	Side scan of casing joint
721.2	Downhole view of well - good visibility and conditions - perfs clear
804.7	Side scan of casing joint
860.2	Downhole view of well
904.8	Side scan of casing joint
945.6	Side scan of perforations - very clean no blockage

Notes:

12 WELLBORE SHAPSHOTS

451.8 Ft (Enlargement)

453.3 Ft (Enlargement)

483.3 Ft (Enlargement)

571.2 Ft (Enlargement)

583.8 Ft (Enlargement)

587.9 Ft (Enlargement)

684.3 Ft (Enlargement)

721.2 Ft (Enlargement)

804.7 Ft (Enlargement)

860.2 Ft (Enlargement)

904.8 Ft (Enlargement)

945.6 Ft (Enlargement)

Southwest Exploration Services, LLC

borehole geophysics & video services

Southwest Exploration Services, LLC

25811 S. Arizona Avenue Chandler, AZ. 85248

Phone: (480) 926-4558 Fax: (480) 926-4579 Web: www.swexp.com

Client: Florence Copper | Survey Date: July 19, 2017

Address: | Invoice: | Run: 1

City: | Country: | **Well Name:** O-05B

Requested By: Florence / H&A | P.O.: | **Well Owner:**

Copy To: | Camera:

Purpose: General Inspection | Zero Datum: Top of Casing

Location: | Depth: | Vehicle: 310

Field: Florence Copper

1st Csg.O.D. | Csg Weight: | From: | To: | 2nd Csg.O.D. | Csg Weight: | From: | To:

Standing Water Level: | Pumping Water Level: | Pump Depth: | O.D.Ref.: Measured | Casing Buildup: None

Operator: A. Olson | Lat.: | Long.: | Sec: | Twp: | Rge:

Other Information:

Wellbore Snapshots

1024.1 Ft (See Other Side)

1171.7 Ft (See Other Side)

1183.3 Ft (See Other Side)

1183.8 Ft (See Other Side)

1196 Ft (See Other Side)

1200.1 Ft (See Other Side)

1201.7 Ft (See Other Side)

True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
1,024.1	Downhole view of well - good water clarity
1,171.7	Same as above
1,183.3	Downhole view of perforations - moderately to highly clogged
1,183.8	Side scan of buildup material on perforations
1,196	Downhole view of well/perfs - minor to moderate buildup on perforations
1,200.1	Moderately to highly plugged perforations
1,201.7	Soft fill - TD of well

Notes:

Page Number: 5

7 WELLBORE SHAPSHOTS

1024.1 Ft (Enlargement)

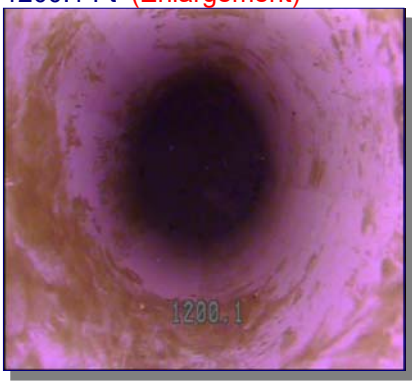
1171.7 Ft (Enlargement)

1183.3 Ft (Enlargement)

1183.8 Ft (Enlargement)

1196 Ft (Enlargement)

1200.1 Ft (Enlargement)



1201.7 Ft (Enlargement)

APPENDIX J

Well O-05 Completion Records

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

FLORENCE COPPER and FLORENCE COPPR

O-05

Tuesday - May 30, 2017

Southwest Exploration Services, LLC
borehole geophysics & video services

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company: FLORENCE COPPER **Well Owner:** FLORENCE COPPR

County: PINAL **State:** Arizona **Country:** United States

Well Number: O-05 **Survey Date:** Tuesday - May 30, 2017 **Magnetic Declination:** Declination Correction Not Used

Field: FLORE4NCE COPPER **Drift Calculation Methodology:** Balanced Tangential Method

Location: FLORENCE COPPR

Remarks:

Witness: KENDRA / H&A **Vehicle No.:** 310 **Invoice No.:** **Operator:** D. ECKMAN **Well Depth:** 1020 Feet **Casing size:** 10.625 Inches

Tool: Gyro - 201 **Lat.:** **Long.:** **Sec.:** **Twp.:** **Rge.:**

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
20	0.10	304.64	20.00						
40	0.21	015.77	39.99	0.045	-0.004	0.42	3.00	0.05' (.60")	354.40
60	0.29	205.30	59.98	0.035	-0.016	0.96	5.15	0.04' (.48")	335.60
80	0.10	293.10	79.97	-0.004	-0.054	0.84	3.58	0.05' (.60")	265.80
100	0.36	129.89	99.97	-0.037	-0.022	0.42	5.11	0.04' (.48")	210.30
120	0.24	139.25	119.96	-0.109	0.054	0.14	0.42	0.12' (1.44")	153.80
140	0.42	123.80	139.95	-0.182	0.142	0.43	0.69	0.23' (2.76")	141.90
160	0.19	144.11	159.94	-0.250	0.222	0.83	0.91	0.33' (3.96")	138.30
180	0.30	115.67	179.93	-0.300	0.289	0.95	1.27	0.42' (5.04")	136.10
200	0.06	152.92	199.92	-0.332	0.341	0.38	1.65	0.48' (5.76")	134.20
220	0.31	235.85	219.91	-0.372	0.301	1.00	3.42	0.48' (5.76")	141.00
240	0.58	213.96	239.90	-0.486	0.200	1.00	0.98	0.53' (6.36")	157.70
260	0.53	221.97	259.89	-0.639	0.082	0.35	0.36	0.64' (7.68")	172.70
280	0.48	214.99	279.88	-0.776	-0.028	0.93	0.31	0.78' (9.36")	182.10
300	0.19	212.34	299.87	-0.873	-0.094	0.79	0.12	0.88' (10.56")	186.10
320	0.34	201.35	319.86	-0.956	-0.133	0.51	0.49	0.97' (11.64")	187.90
340	0.22	192.90	339.85	-1.049	-0.163	0.01	0.38	1.06' (12.72")	188.80
360	0.36	208.26	359.84	-1.142	-0.201	0.54	0.69	1.16' (13.92")	190.00

True Vertical Depth: 1194.43' **Final Drift Distance:** 2.48' (29.76") **Final Drift Bearing:** 229.10°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

O-05

(480) 926-4558

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
380	0.44°	225.51°	379.83	-1.251	-0.286	0.74	0.77	1.28' (15.36")	192.90
400	0.48°	240.28°	399.82	-1.346	-0.414	0.89	0.66	1.41' (16.92")	197.10
420	0.51°	268.93°	419.81	-1.389	-0.576	0.22	1.28	1.50' (18.00")	202.50
440	0.52°	286.91°	439.80	-1.364	-0.752	0.97	0.81	1.56' (18.72")	208.90
460	0.58°	290.35°	459.79	-1.302	-0.934	0.97	0.16	1.60' (19.20")	215.60
480	0.48°	302.06°	479.78	-1.222	-1.100	0.15	0.53	1.64' (19.68")	222.00
500	0.53°	306.34°	499.77	-1.123	-1.246	0.83	0.19	1.68' (20.16")	228.00
520	0.48°	293.15°	519.76	-1.035	-1.398	0.61	0.59	1.74' (20.88")	233.50
540	0.50°	282.98°	539.75	-0.982	-1.560	0.71	0.46	1.84' (22.08")	237.80
560	0.40°	270.74°	559.74	-0.961	-1.715	0.25	0.55	1.97' (23.64")	240.70
580	0.18°	204.60°	579.73	-0.989	-1.798	0.76	2.82	2.05' (24.60")	241.20
600	0.11°	200.49°	599.72	-1.036	-1.818	0.51	0.19	2.09' (25.08")	240.30
620	0.26°	238.95°	619.71	-1.077	-1.864	0.71	1.70	2.15' (25.80")	240.00
640	0.13°	208.45°	639.70	-1.120	-1.914	0.10	1.36	2.22' (26.64")	239.70
660	0.28°	160.85°	659.69	-1.186	-1.909	0.84	2.08	2.25' (27.00")	238.10
680	0.09°	152.65°	679.68	-1.246	-1.886	0.82	0.37	2.26' (27.12")	236.50
700	0.06°	141.34°	699.67	-1.268	-1.872	0.21	0.51	2.26' (27.12")	235.90
720	0.44°	191.03°	719.66	-1.352	-1.880	0.57	2.17	2.32' (27.84")	234.30
740	0.31°	202.18°	739.65	-1.477	-1.915	0.27	0.50	2.42' (29.04")	232.40
760	0.15°	220.58°	759.64	-1.547	-1.952	0.93	0.83	2.49' (29.88")	231.60
780	0.32°	232.96°	779.63	-1.601	-2.014	0.62	0.56	2.57' (30.84")	231.50
800	0.29°	190.10°	799.62	-1.684	-2.067	0.96	1.89	2.67' (32.04")	230.80
820	0.31°	120.91°	819.61	-1.762	-2.029	0.10	2.93	2.69' (32.28")	229.00
840	0.60°	165.68°	839.60	-1.891	-1.957	0.33	1.97	2.72' (32.64")	226.00
860	0.29°	056.68°	859.59	-1.965	-1.889	0.54	4.21	2.73' (32.76")	223.90
880	0.40°	066.32°	879.58	-1.909	-1.783	0.50	0.43	2.61' (31.32")	223.00
900	0.11°	059.66°	899.57	-1.871	-1.702	0.46	0.30	2.53' (30.36")	222.30
920	0.38°	339.32°	919.56	-1.799	-1.709	0.66	3.33	2.48' (29.76")	223.50
940	0.21°	325.15°	939.55	-1.707	-1.753	0.09	0.64	2.45' (29.40")	225.80
960	0.22°	331.38°	959.54	-1.643	-1.792	0.25	0.28	2.43' (29.16")	227.50
980	0.17°	314.51°	979.53	-1.588	-1.832	0.99	0.76	2.42' (29.04")	229.10
1,000	0.14°	279.24°	999.53	-1.563	-1.877	0.93	1.56	2.44' (29.28")	230.20
1,020	0.30°	266.80°	1,019.52	-1.562	-1.953	0.97	0.56	2.50' (30.00")	231.40

True Vertical Depth: 1194.43' **Final Drift Distance: 2.48' (29.76")** **Final Drift Bearing: 229.10°**

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

O-05

(480) 926-4558

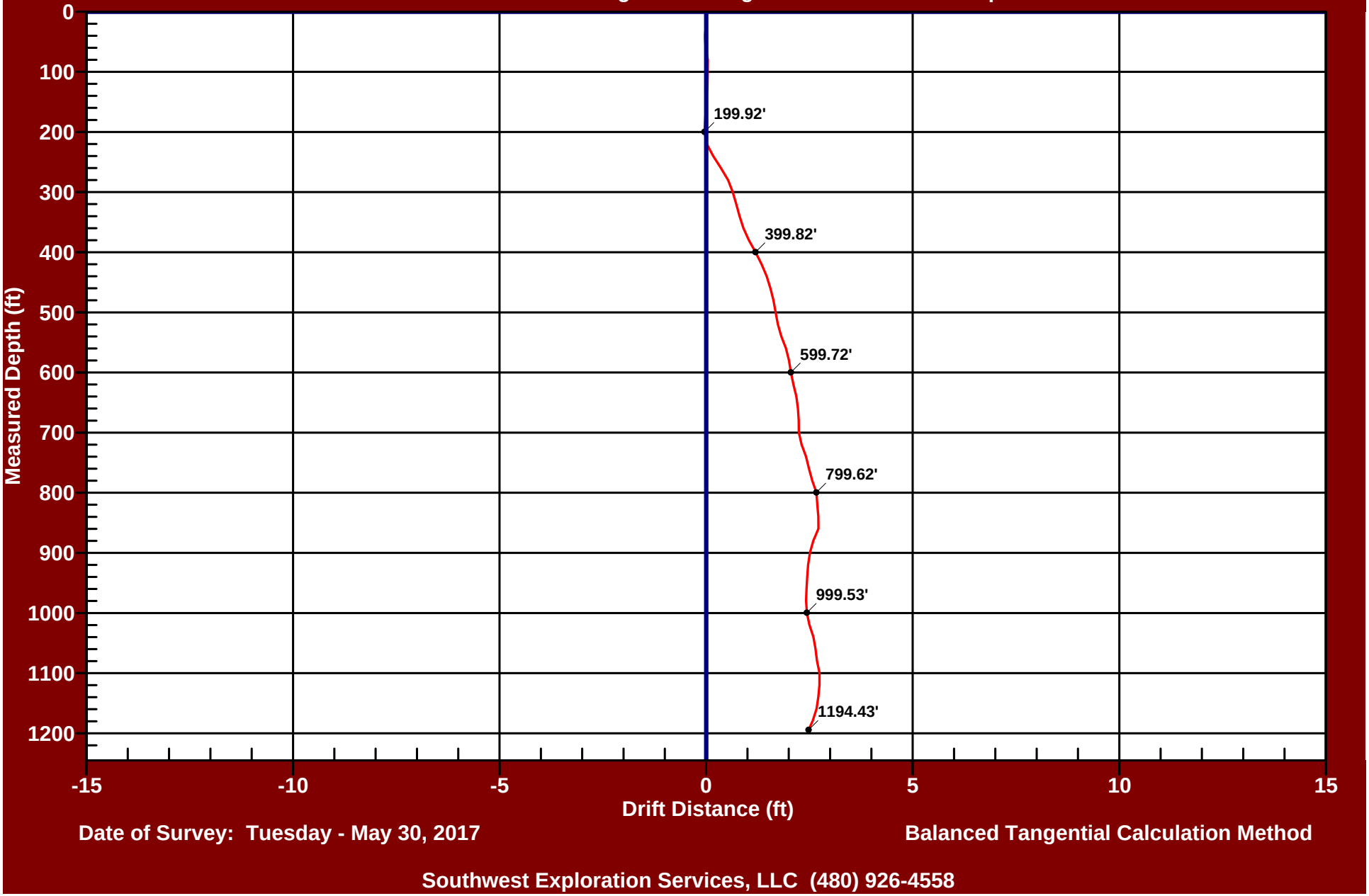
MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
1,040	0.37°	264.82°	1,039.51	-1.571	-2.070	0.42	0.09	2.60' (31.20")	232.80
1,060	0.27°	318.24°	1,059.50	-1.542	-2.166	0.20	2.32	2.66' (31.92")	234.60
1,080	0.22°	248.63°	1,079.49	-1.521	-2.233	0.90	2.95	2.70' (32.40")	235.70
1,100	0.13°	203.62°	1,099.48	-1.556	-2.278	0.04	1.98	2.76' (33.12")	235.70
1,120	0.08°	070.63°	1,119.47	-1.572	-2.274	0.10	4.74	2.76' (33.12")	235.30
1,140	0.16°	108.40°	1,139.46	-1.576	-2.234	0.97	1.67	2.73' (32.76")	234.80
1,160	0.34°	101.75°	1,159.45	-1.597	-2.149	0.49	0.30	2.68' (32.16")	233.40
1,180	0.46°	092.14°	1,179.44	-1.612	-2.011	0.76	0.43	2.58' (30.96")	231.30
1,195	0.58°	095.99°	1,194.43	-1.622	-1.875	1.00	0.23	2.48' (29.76")	229.10

True Vertical Depth: 1194.43' **Final Drift Distance: 2.48' (29.76")** **Final Drift Bearing: 229.10°**

PLANE OF DRIFT VIEW - O-05

FLORENCE COPPER
FLORENCE COPPR

Drift Distance = 2.48 Feet Drift Bearing = 229.1 Degrees True Vertical Depth = 1194.43 Feet



Date of Survey: Tuesday - May 30, 2017

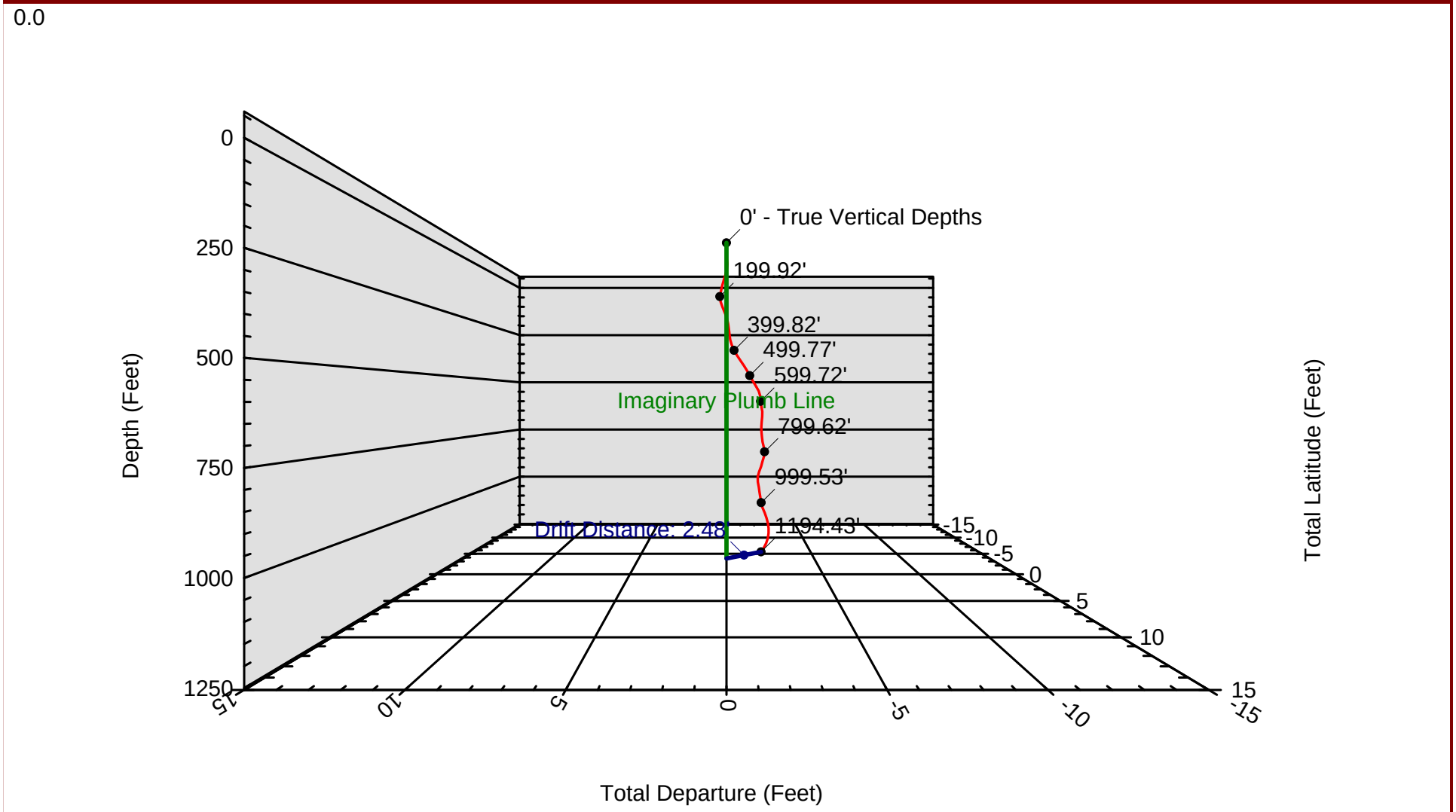
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - O-05

FLORENCE COPPER
FLORENCE COPPR

Drift Distance = 2.48 Feet **Drift Bearing = 229.1 Degrees** **True Vertical Depth = 1194.43 Feet**



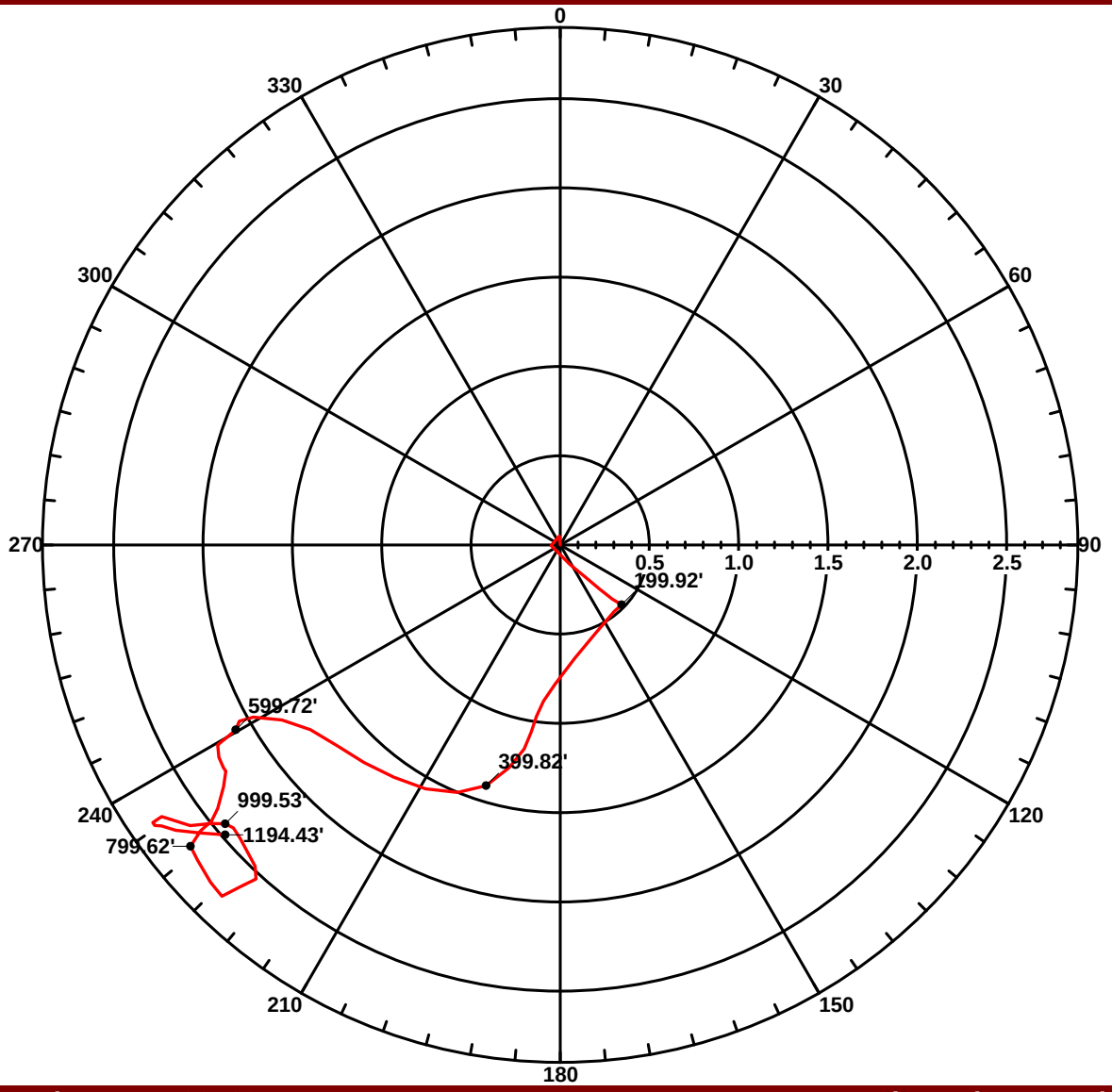
Date of Survey: Tuesday - May 30, 2017 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - O-05

FLORENCE COPPER
FLORENCE COPPR

Drift Distance = 2.48 Feet Drift Bearing = 229.1 Degrees True Vertical Depth = 1194.43 Feet



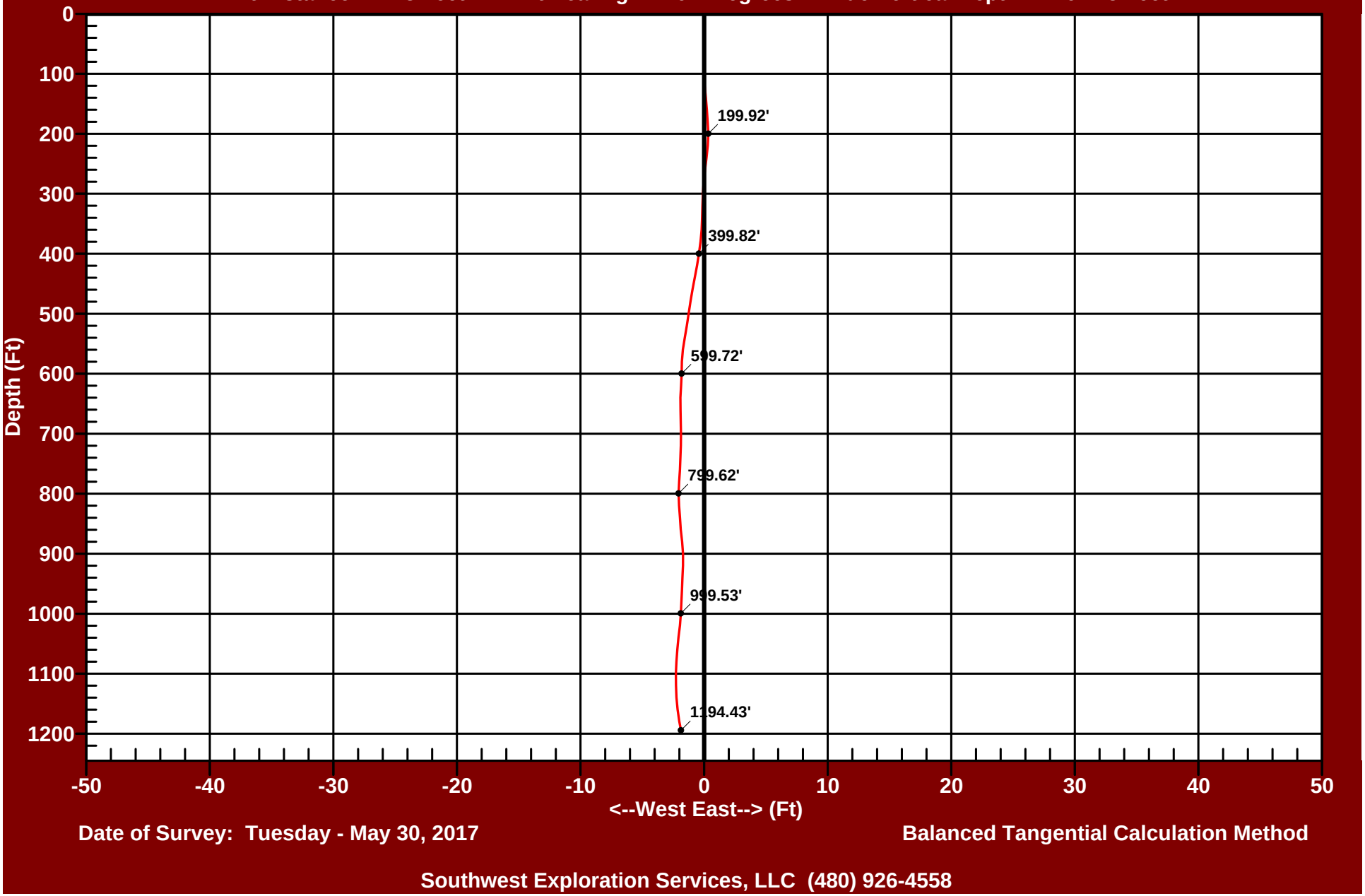
Date of Survey: Tuesday - May 30, 2017 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

EASTING RECTANGULAR VIEW - O-05

FLORENCE COPPER
FLORENCE COPPR

Drift Distance = 2.48 Feet Drift Bearing = 229.1 Degrees True Vertical Depth = 1194.43 Feet



Date of Survey: Tuesday - May 30, 2017

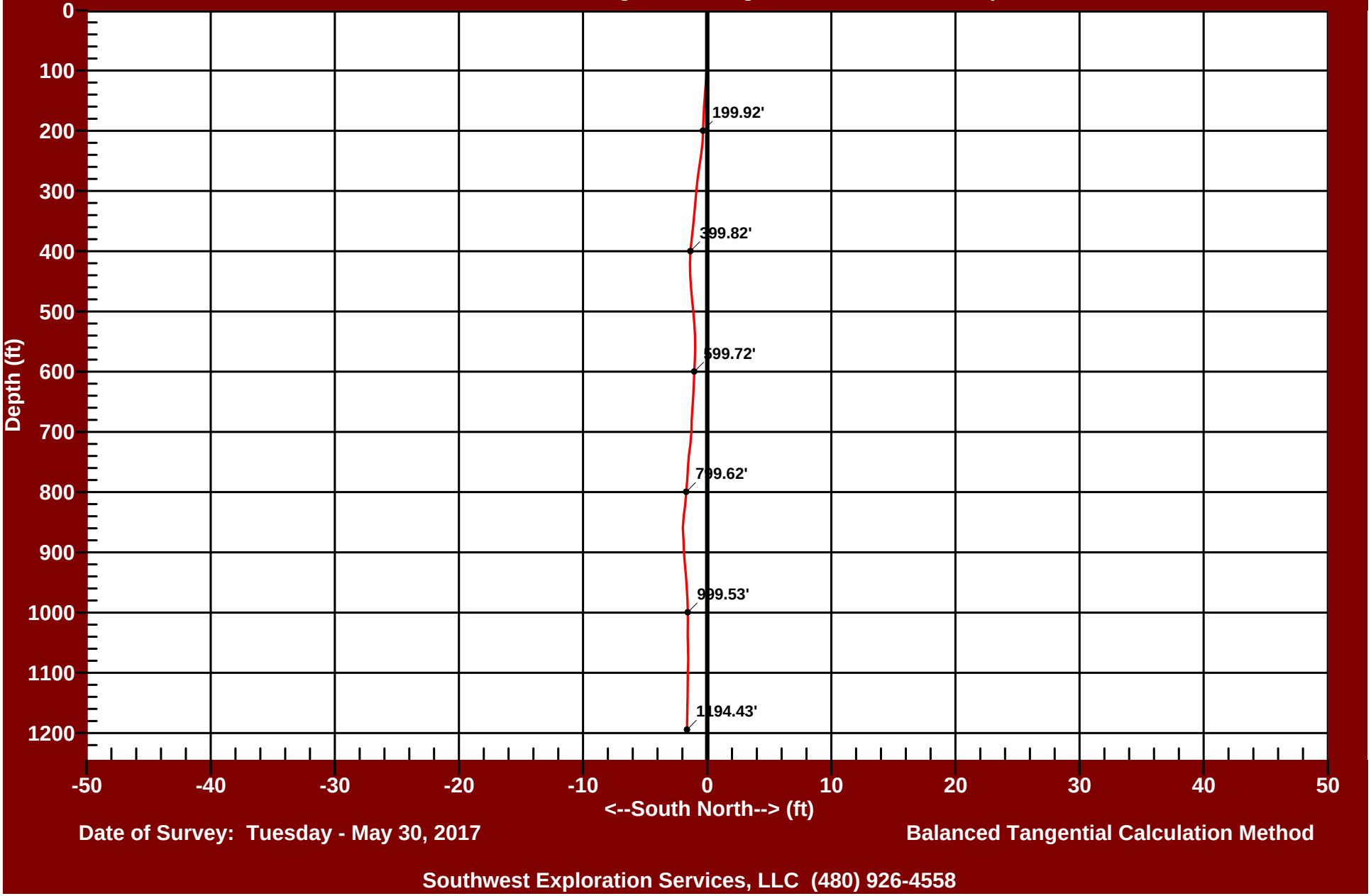
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - O-05

FLORENCE COPPER
FLORENCE COPPR

Drift Distance = 2.48 Feet Drift Bearing = 229.1 Degrees True Vertical Depth = 1194.43 Feet



Date of Survey: Tuesday - May 30, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	0-05
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: E-LOGS - GAMMA

MORE:

LOCATION

SEC TWP RGE

OTHER SERVICES
TEMPERATURE
FLUID RESISITIVITY
SONIC
DEVIATION

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	5-30-2	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	E-LOGS - GAMMA	VISCOSITY	N/A
DEPTH-DRILLER	1210 FT.	LEVEL	FULL
DEPTH-LOGGER	120 FT.	MAX. REC. TEMP.	32. DEG. C
BTM LOGGED INTERVAL	120 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	NATIONAL DRILLING	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	D. ECKMAN / E. TURNER	TOOL STRING/SN	GEOVISTA E-LOG SN 4035
WITNESSED BY	KENDRA / H&A	LOG TIME:ON SITE/OFF SITE	5:00 P.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	40 FT.
2	10 5/8 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

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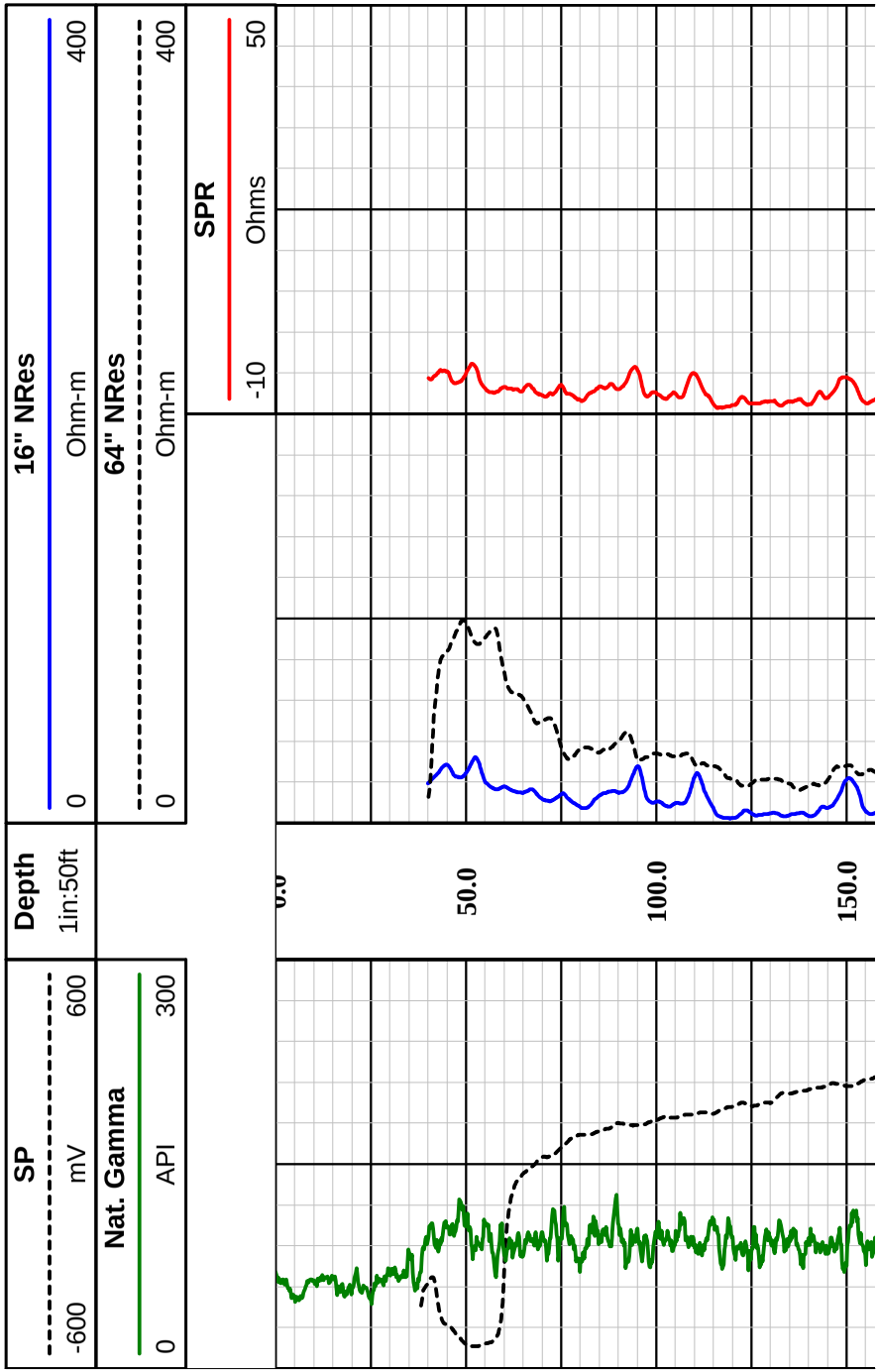

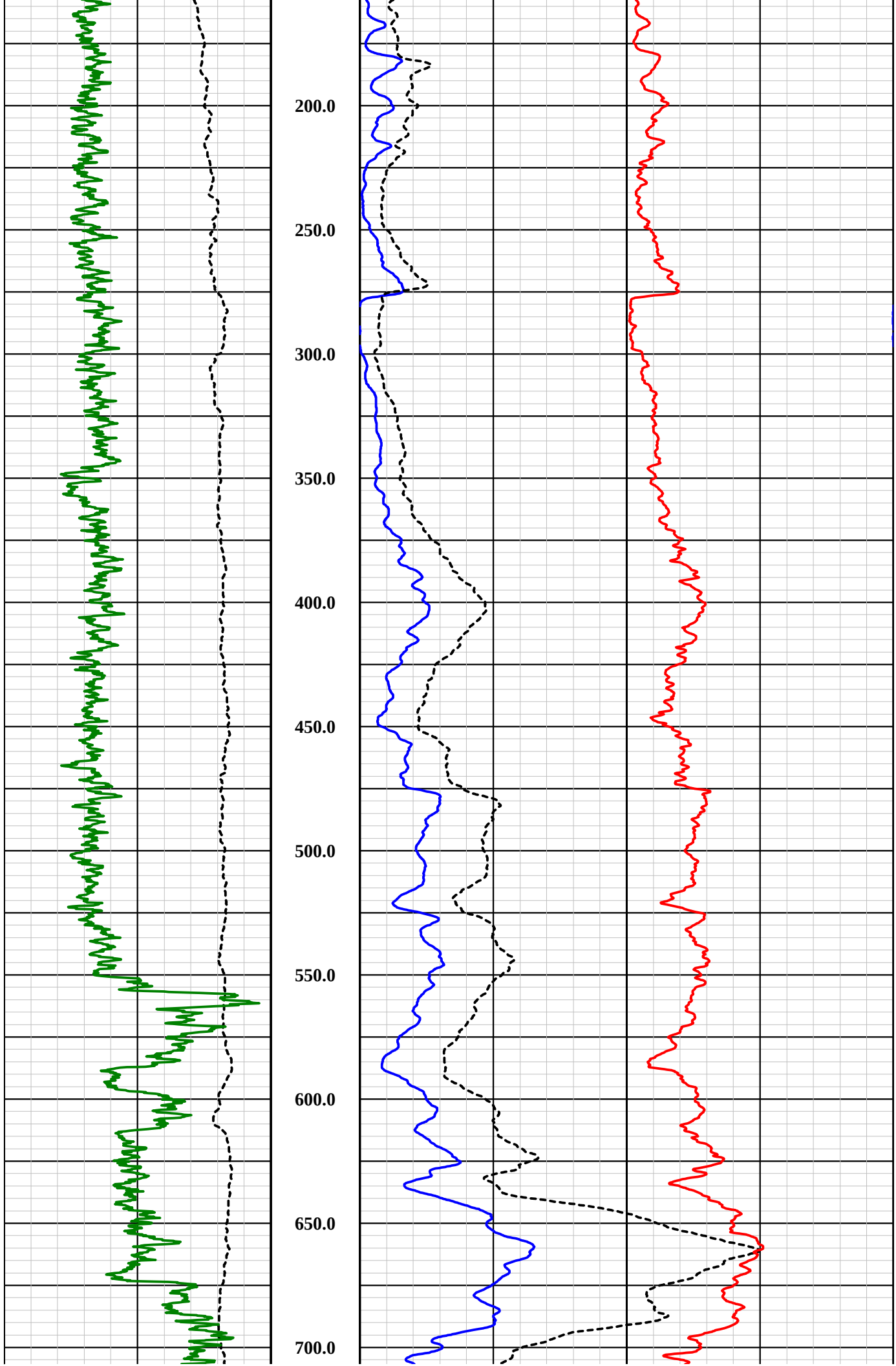
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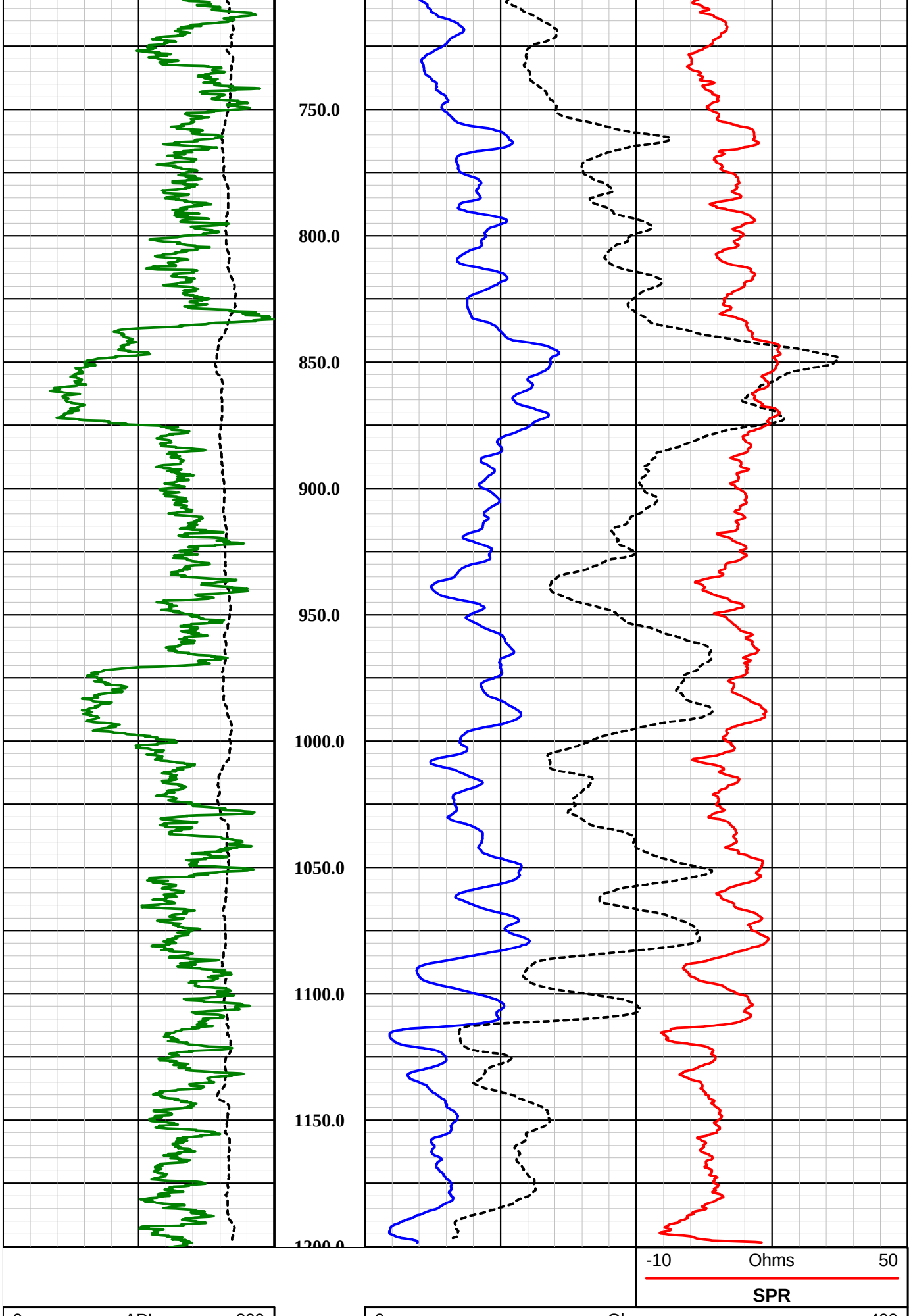
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SPR
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API
300
Nat. Gamma
0
Ohm-m
400
64" NRes
-600
mV
600
1in:50ft
0
Ohm-m
400

SP	Depth	16" NRes

GeoVista E-Log Tool

Tool SN: 4035 & 4790

Probe Top = Depth Ref.

Bridle connects to wireline cablehead: Wireline armor is the B Electrode.

Four Conductor Probe Top

Bridle Electrode (N Electrode)

64" Normal Resistivity Electrode/Spontaneous Potential Electrode (M Electrode)

Probe Length = 2.3 m or 7.55 ft
Bridle Length = 10.0 m or 32.81 ft

Probe Weight = 7.0 kg or 15.4 lbs

Can only be collected in fluid

Isolation Bridle - Not shown in diagram but is necessary for operation

Electrode Measuring Points (from bottom of probe)
- **Spontaneous Potential (SP): 0.65 m or 2.13 ft**
- **16" Normal Resistivity (16" NRes): 0.50 m or 1.64 ft**
- **64" Normal Resistivity (64" NRes): 1.10 m or 3.61 ft**
- **Single Point Resistance (SPR): 0.25 m or 0.82 ft**

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)

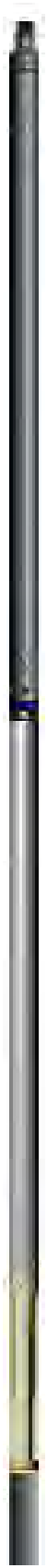
16" Normal Resistivity Electrode (M Electrode)

Current Electrode/Single Point Resistance (A Electrode)

1.65" or 42 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

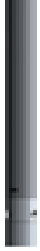
Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"



TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC

borehole geophysics & video services

Company	FLORENCE COPPER
Well	0-05
Field	FLORNECE COPPER
County	PINAL
State	ARIZONA

Preliminary E-LOG SUMMARY

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY FLORENCE COPPER
WELL ID O-05
FIELD FLORENCE COPPER
COUNTY PINAL STATE ARIZONA

TYPE OF LOGS: GAMMA - CALIPER
MORE: TEMP - FLUID RES.
LOCATION

SEC TWP RGE

OTHER SERVICES
E-LOGS
SONIC
DEVIATION

PERMANENT DATUM ELEVATION K.B.
LOG MEAS. FROM GROUND LEVEL ABOVE PERM. DATUM D.F.
DRILLING MEAS. FROM GROUND LEVEL G.L.

DATE	5-30-2017	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	GAMMA-CALIPER-TFR	VISCOSITY	N/A
DEPTH-DRILLER	1210 FT.	LEVEL	FULL
DEPTH-LOGGER	1202 FT.	MAX. REC. TEMP.	32.03 DEG. C
BTM LOGGED INTERVAL	1202 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	NATIONAL DRILLING	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	D. ECKMAN / E. TURNER	TOOL STRING/SN	MSI COMBO TOOL SN 4953
WITNESSED BY	KENDRA / H&A	LOG TIME:ON SITE/OFF SITE	1:00 P.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	40 FT.
2	10 5/8 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

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Tool Summary:

Date	5-30-2017	**Date**	5-30-2017	**Date**	5-30-2017	**Date**	5-30-2017
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	MSI 60mm SONIC		
Tool SN	4953	**Tool SN**	5513	**Tool SN**	6003		
From	SURFACE	**From**	SURFACE	**From**	SURFACE		
To	1200 FT.	**To**	1200 FT.	**To**	1200 FT.		
Recorded By	D. ECKMAN	**Recorded By**	D. ECKMAN	**Recorded By**	D. ECKMAN		
Truck No	310	**Truck No**	310	**Truck No**	310		
Operation Check	5-25-2017	**Operation Check**	5-25-2017	**Operation Check**	3-7-17		
Calibration Check	5-25-2017	**Calibration Check**	5-25-2017	**Calibration Check**	N/A		
Time Logged	5:05 P.M.	**Time Logged**	6:10 P.M.	**Time Logged**	7:00 P.M.		

Date	5-30-2017	**Date**		**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	MSI DEVIATION	**Tool Model**		**Tool Model**	
Tool SN	6002	**Tool SN**		**Tool SN**	
From	SURFACE	**From**		**From**	
To	1200 FT.	**To**		**To**	
Recorded By	D. ECKMAN	**Recorded By**		**Recorded By**	
Truck No	310	**Truck No**		**Truck No**	
Operation Check	5-25-2017	**Operation Check**		**Operation Check**	
Calibration Check	N/A	**Calibration Check**		**Calibration Check**	
Time Logged	P.M.	**Time Logged**		**Time Logged**	

Additional Comments:

Caliper Arms Used: 15 IN. **Calibration Points:** 8 IN. & 23 IN.

E-Log Calibration Range: 1-1000 OHM-M **Calibration Points:** 1 & 1000 OHM-M

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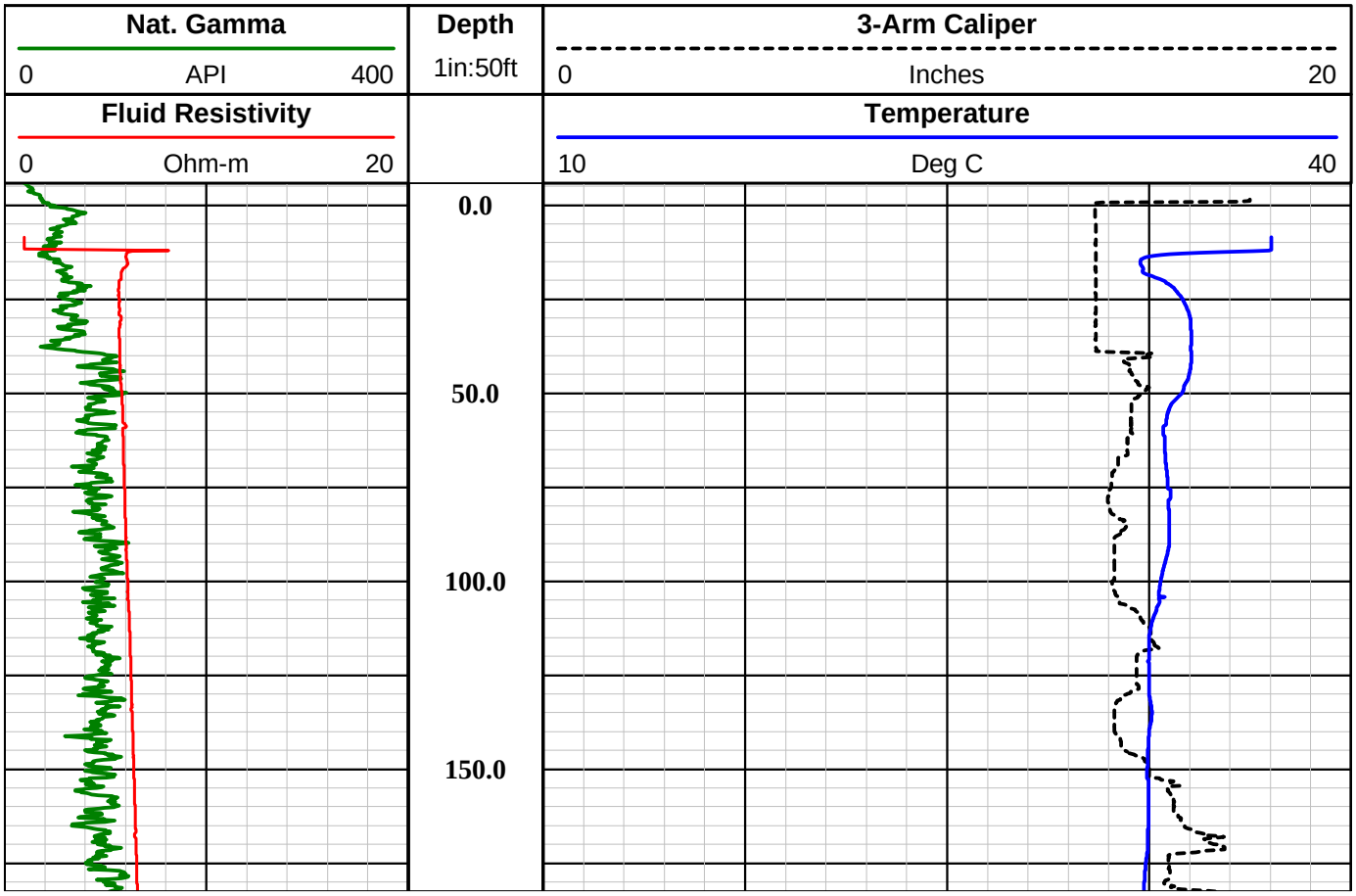

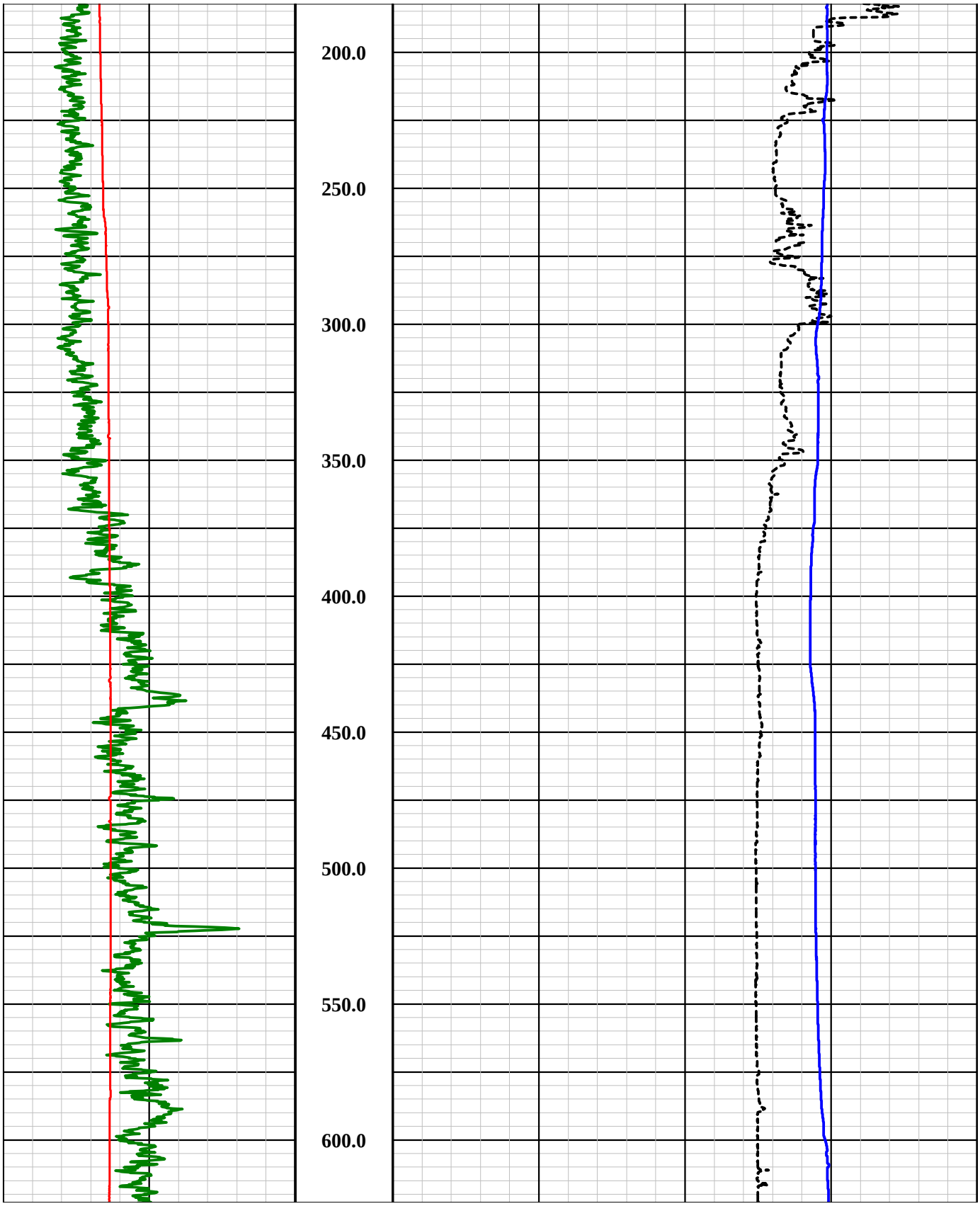
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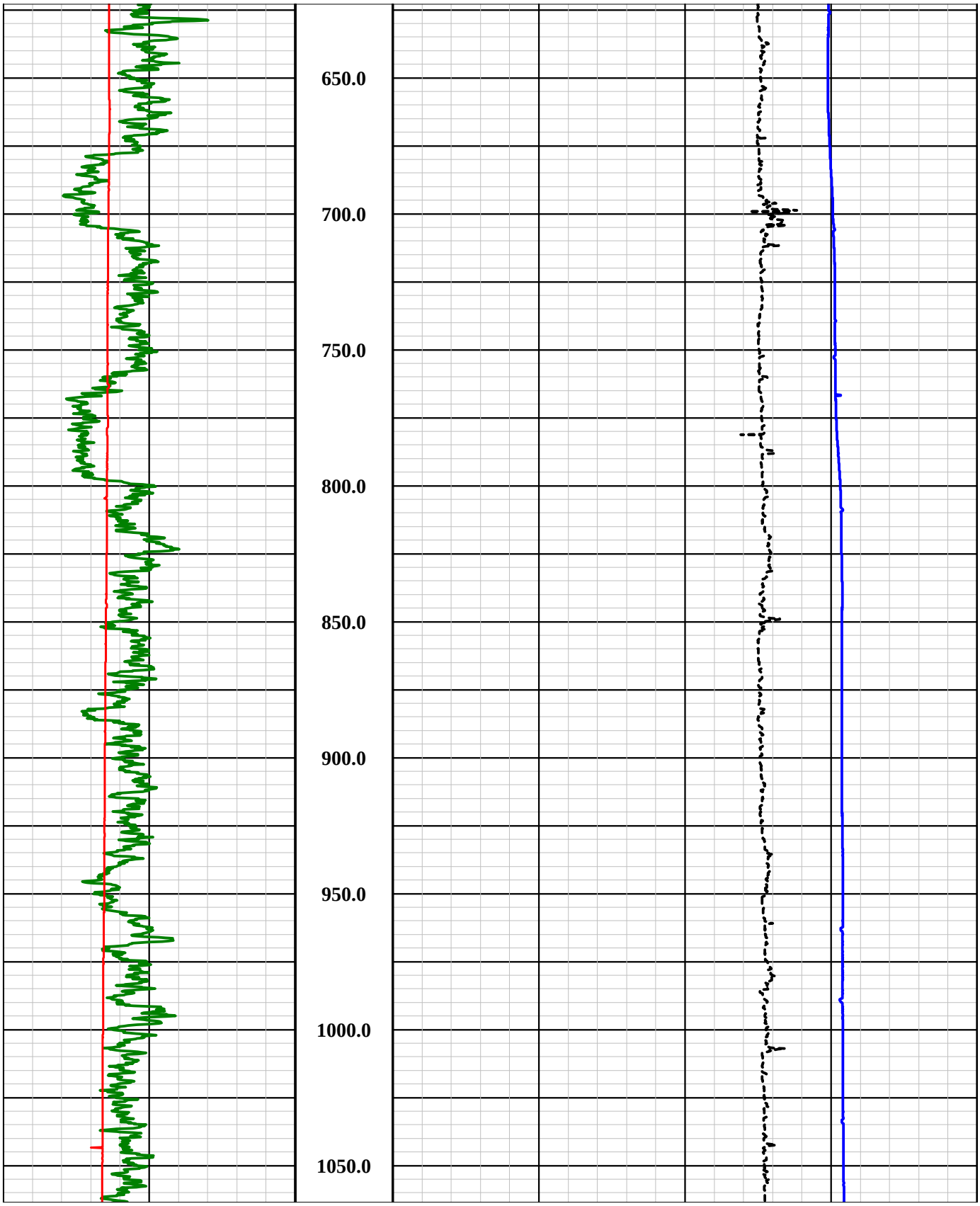
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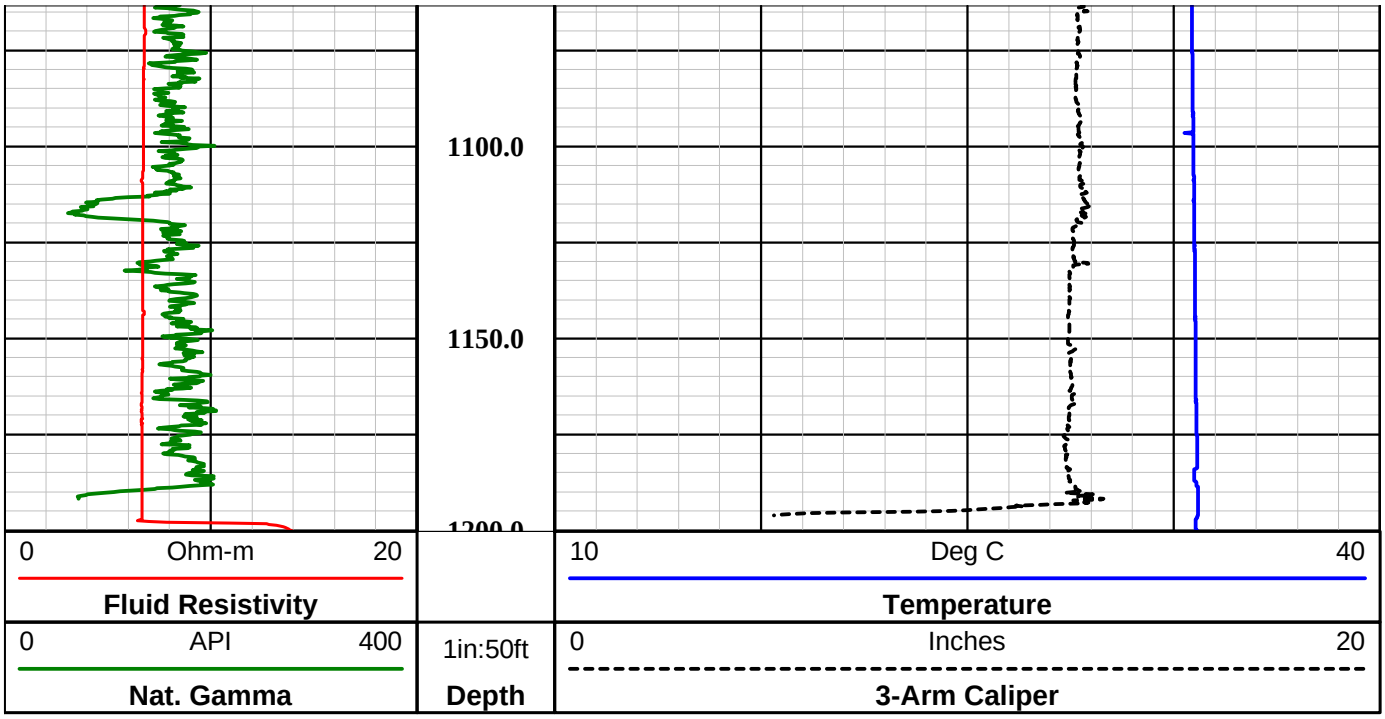

MSI Gamma-Caliper-Temperature-Fluid Resistivity SN 4953

Probe Top = Depth Ref.

Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC

borehole geophysics & video services

Company	FLORENCE COPPER
Well	O-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Preliminary GCT SUMMARY

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY FLORENCE COPPER
WELL ID O-05
FIELD FLORENCE COPPER
COUNTY PINAL STATE ARIZONA

TYPE OF LOGS: MSI 60mm SONIC
MORE: GAMMA - CALIPER

LOCATION

SEC TWP RGE

OTHER SERVICES
E-LOGS
TEMPERATURE
FLUID RESISTIVITY
DEVIATION

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	5-30-2017	TYPE FLUID IN HOLE	MUD
RUN No	1 & 3	MUD WEIGHT	N/A
TYPE LOG	SONIC - GAMMA - CALIPER	VISCOSITY	N/A
DEPTH-DRILLER	1210 FT.	LEVEL	FULL
DEPTH-LOGGER	1200 FT.	MAX. REC. TEMP.	32.03 DEG. C
BTM LOGGED INTERVAL	1200 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.25 FT
DRILLER / RIG#	NATIONAL DRILLING	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	D. ECKMAN / E. TURNER	TOOL STRING/SN	MSI 60mm SONIC SN 6003
WITNESSED BY	KENDRA / H&A	LOG TIME:ON SITE/OFF SITE	5:00 P.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	40 FT.
2	10 5/8 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

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Tool Summary:

Date	5-30-2017	**Date**	5-30-2017	**Date**	5-30-2017		
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	MSI 60mm SONIC		
Tool SN	4953	**Tool SN**	5513	**Tool SN**	6003		
From	SURFACE	**From**	SURFACE	**From**	SURFACE		
To	1200 FT.	**To**	1200 FT.	**To**	1200 FT.		
Recorded By	D. ECKMAN	**Recorded By**	D. ECKMAN	**Recorded By**	D. ECKMAN		
Truck No	310	**Truck No**	310	**Truck No**	310		
Operation Check	5-25-2017	**Operation Check**	5-25-2017	**Operation Check**	3-7-17		
Calibration Check	5-25-2017	**Calibration Check**	5-25-2017	**Calibration Check**	N/A		
Time Logged	5:05 P.M.	**Time Logged**	6:10 P.M.	**Time Logged**	7:00 P.M.		

Date	5-30-2017	**Date**		**Date**			
Run No.	4	**Run No.**	5	**Run No.**	6		
Tool Model	MSI DEVIATION	**Tool Model**		**Tool Model**			
Tool SN	6002	**Tool SN**		**Tool SN**			
From	SURFACE	**From**		**From**			
To	1200 FT.	**To**		**To**			
Recorded By	D. ECKMAN	**Recorded By**		**Recorded By**			
Truck No	310	**Truck No**		**Truck No**			
Operation Check	5-25-2017	**Operation Check**		**Operation Check**			
Calibration Check	N/A	**Calibration Check**		**Calibration Check**			
Time Logged	P.M.	**Time Logged**		**Time Logged**			

Additional Comments:

Caliper Arms Used: 15 IN. **Calibration Points:** 8 IN. & 23 IN.

E-Log Calibration Range: 1-1000 OHM-M **Calibration Points:** 1 & 1000 OHM-M

Disclaimer:

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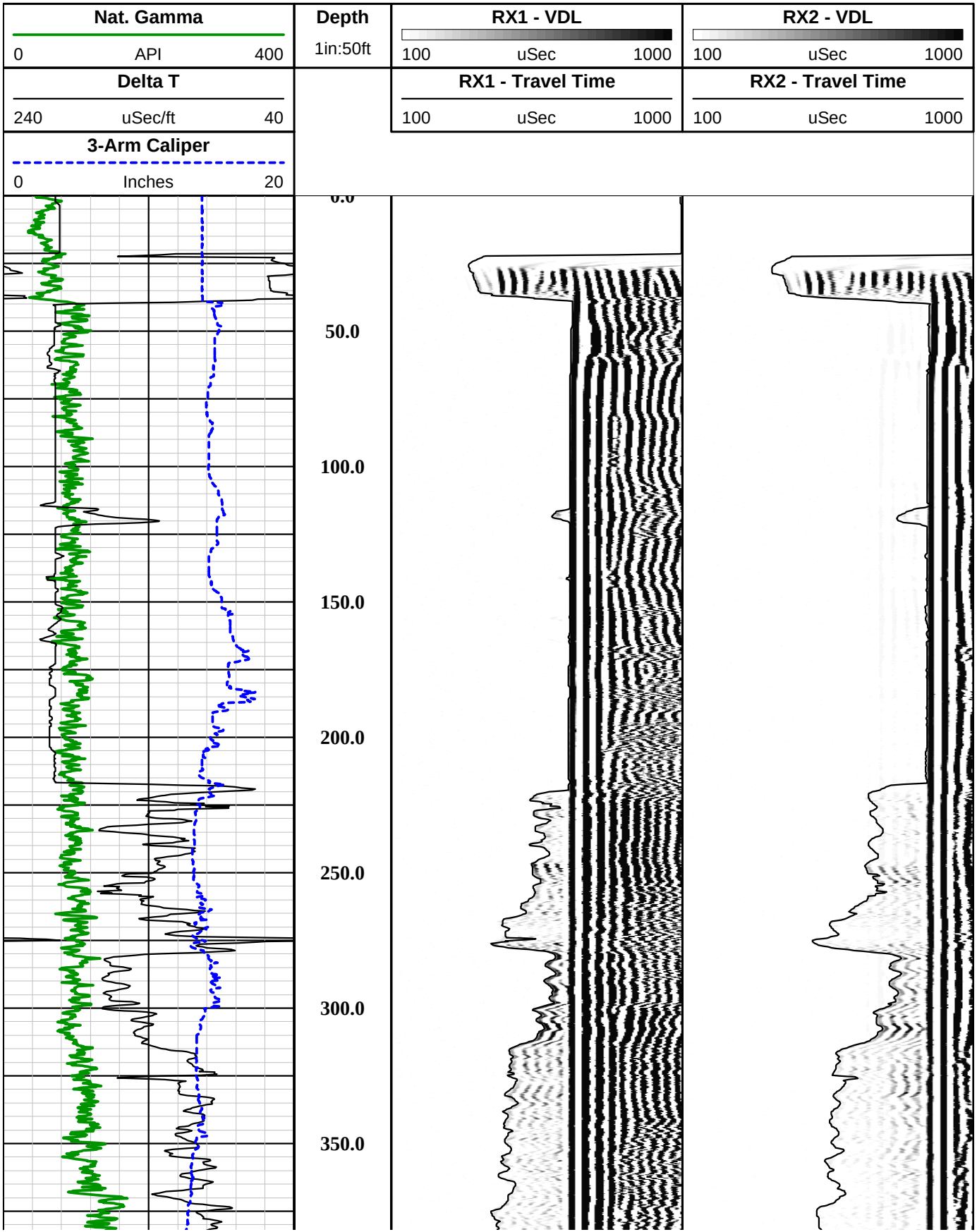

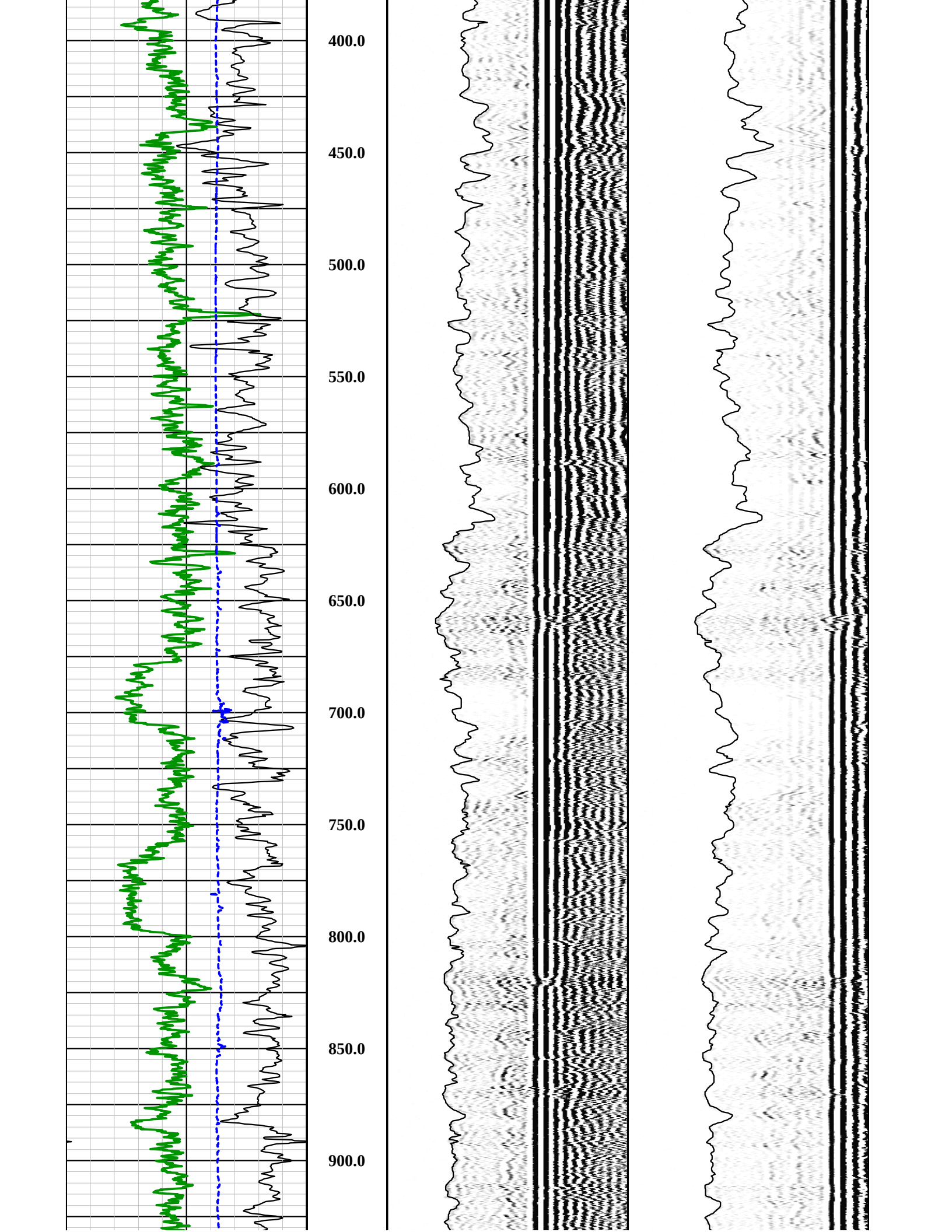
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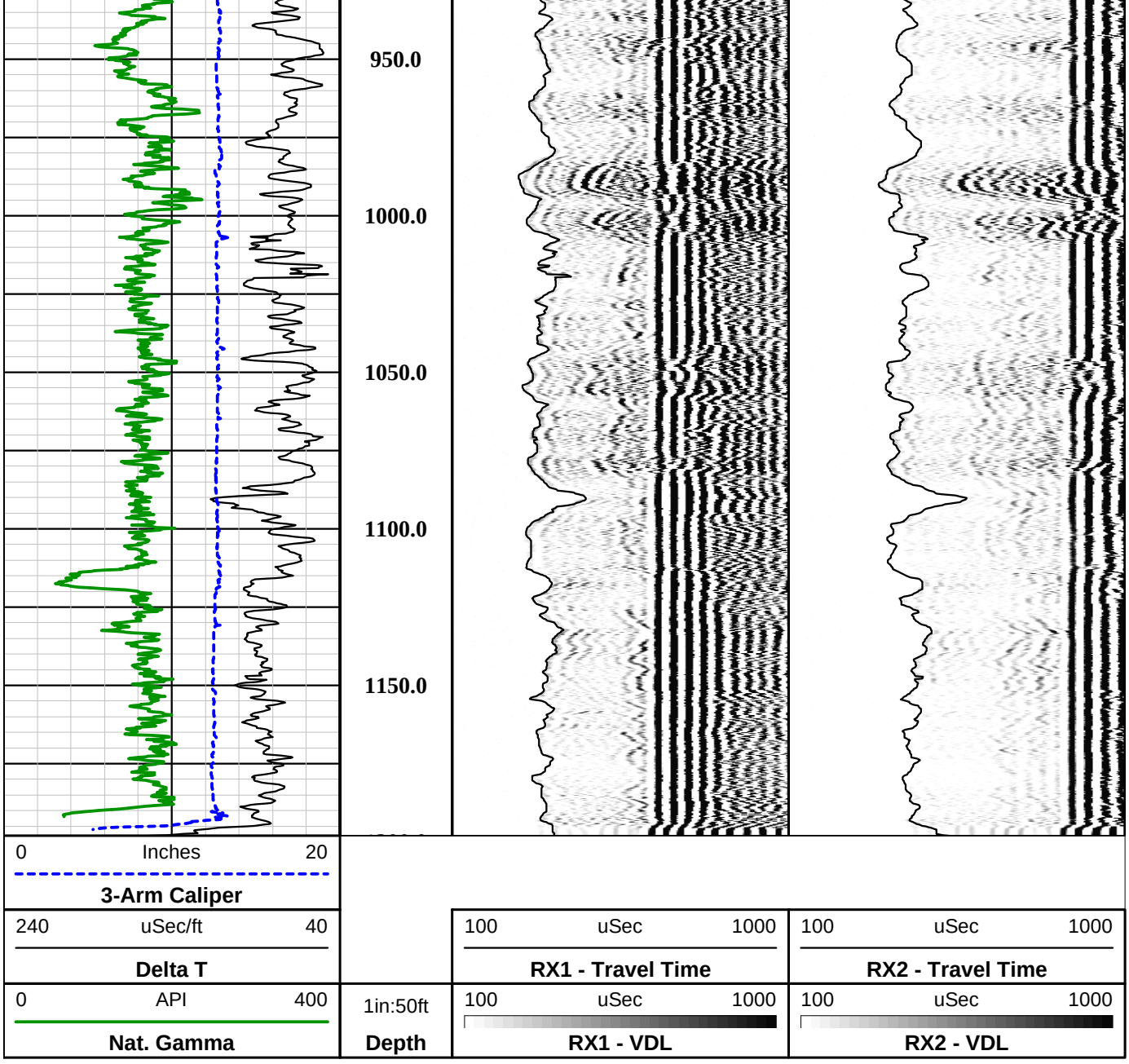


MSI 60 mm 2 RX Full Waveform Sonic Tool

Probe Top = Depth Ref.

Tool SN: 5001, 5050 & 6003

Four Conductor MSI Probe Top

Probe Length = 2.8 m or 9.19 ft
Probe Weight = ~26.5 kg or 58.4 lbs

Sensors: Ceramic Piezoelectric

Transmitter Frequency: 24 - 28 kHz resonant frequency

Rx - Rx Spacing: 0.3 m (12.0 in)

Typically centralized with external centralizers

Can only be collected in fluid

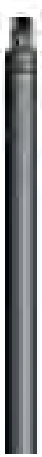
Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)

0.660 m or 26.0 in. - End of tool to center of Tx

2.36 in or 60 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.

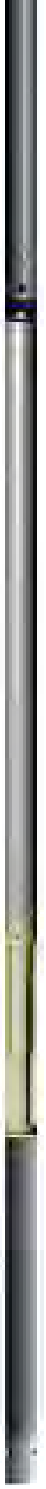


Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)



Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC

borehole geophysics & video services

Company	FLORENCE COPPER
Well	O-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Preliminary SONIC SUMMARY

Southwest Exploration Services, LLC
borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	0-05
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA
TYPE OF LOGS:	CALIPER W / VOLUME
MORE:	
LOCATION	
SEC / TWP / RGE	
OTHER SERVICES	E-LOGS, SONIC, DEVIATION, TEMPERATURE, NAT. GAMMA

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	5-30-2017	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	CALIPER	VISCOSITY	N/A
DEPTH-DRILLER	1210 FT.	LEVEL	FULL
DEPTH-LOGGER	1200 FT.	MAX. REC. TEMP.	32.03 DEG. C
BTM LOGGED INTERVAL	1200 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	NATIONAL DRILLING	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	D. ECKMAN / E. TURNER	TOOL STRING/SN	MSI COMBO TOOL SN 4953
WITNESSED BY	KENDRA / H&A	LOG TIME:ON SITE/OFF SITE	5:00 P.M.

RUN NO.	BOREHOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	40 FT.
2	10 5/8 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

Tool Summary:

Date	5-30-2017	**Date**	5-30-2017	**Date**	5-30-2017
Run No.	1	**Run No.**	2	**Run No.**	3
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	MSI 60mm SONIC
Tool SN	4953	**Tool SN**	5513	**Tool SN**	6003
From	SURFACE	**From**	SURFACE	**From**	SURFACE
To	1200 FT.	**To**	1200 FT.	**To**	1200 FT.
Recorded By	D. ECKMAN	**Recorded By**	D. ECKMAN	**Recorded By**	D. ECKMAN
Truck No	310	**Truck No**	310	**Truck No**	310
Operation Check	5-25-2017	**Operation Check**	5-25-2017	**Operation Check**	3-7-17
Calibration Check	5-25-2017	**Calibration Check**	5-25-2017	**Calibration Check**	N/A
Time Logged	5:05 P.M.	**Time Logged**	6:10 P.M.	**Time Logged**	7:00 P.M.

Date	5-30-2017	**Date**		**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	MSI DEVIATION	**Tool Model**		**Tool Model**	
Tool SN	6002	**Tool SN**		**Tool SN**	
From	SURFACE	**From**		**From**	
To	1200 FT.	**To**		**To**	
Recorded By	D. ECKMAN	**Recorded By**		**Recorded By**	
Truck No	310	**Truck No**		**Truck No**	
Operation Check	3-7-17	**Operation Check**		**Operation Check**	
Calibration Check	N/A	**Calibration Check**		**Calibration Check**	
Time Logged	P.M.	**Time Logged**		**Time Logged**	

Additional Comments:

Caliper Arms Used: 15 IN. **Calibration Points:** 8 IN. & 23 IN.

E-Log Calibration Range: 1-1000 OHM-M **Calibration Points:** 1 & 1000 OHM-M

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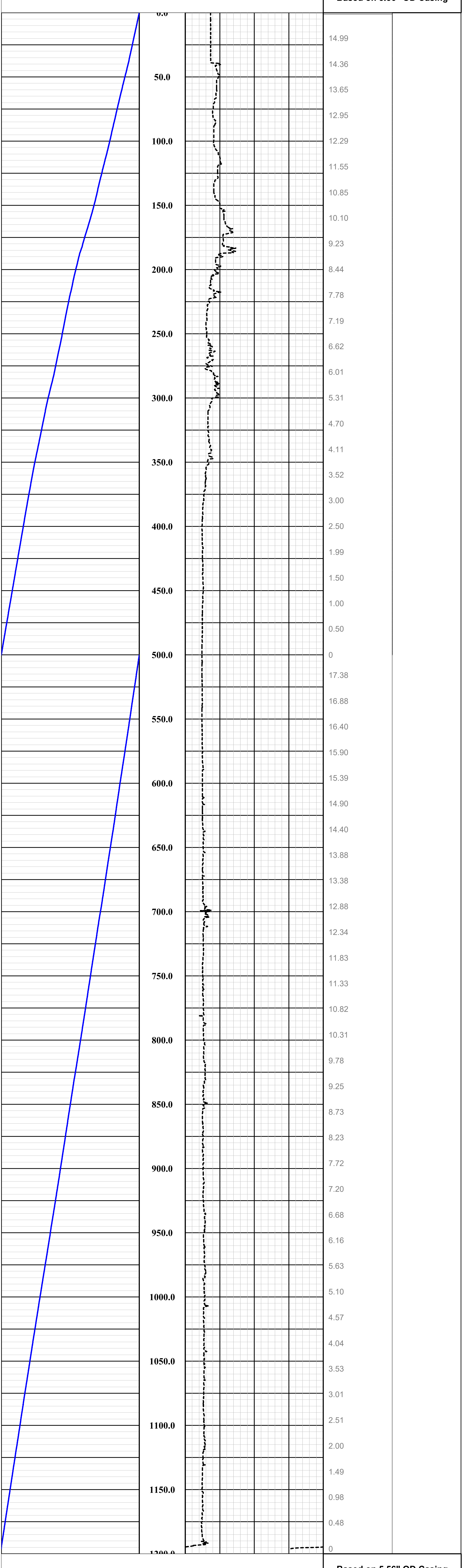
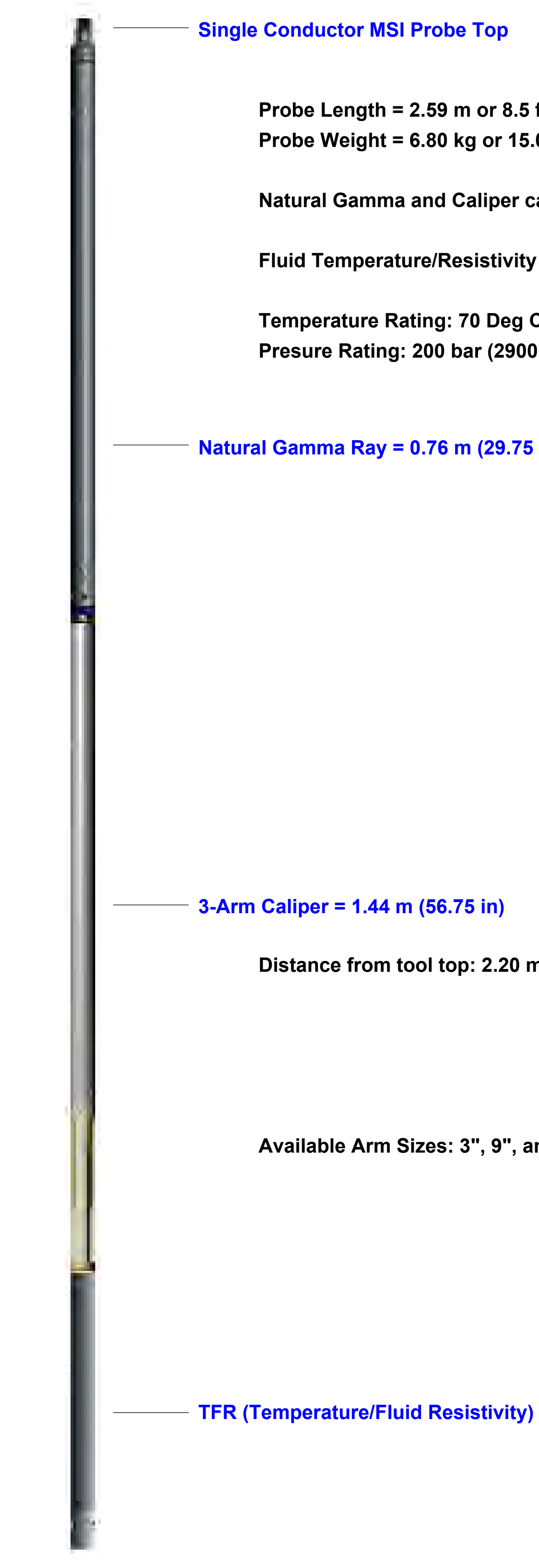


MSI Gamma-Caliper-Temperature-Fluid Resistivity SN 4953

Probe Top = Depth Ref.



Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	0-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Preliminary **CALIPER W / SUMMARY**

ESTIMATED ANNULAR MATERIAL RECORD

Project Name: FCI **Project #.:** 129687-005 **Date:** 5-31-17
Well No.: O-05 **Geologist:** C Price + RFords

ANNULAR VOLUME CALCULATIONS

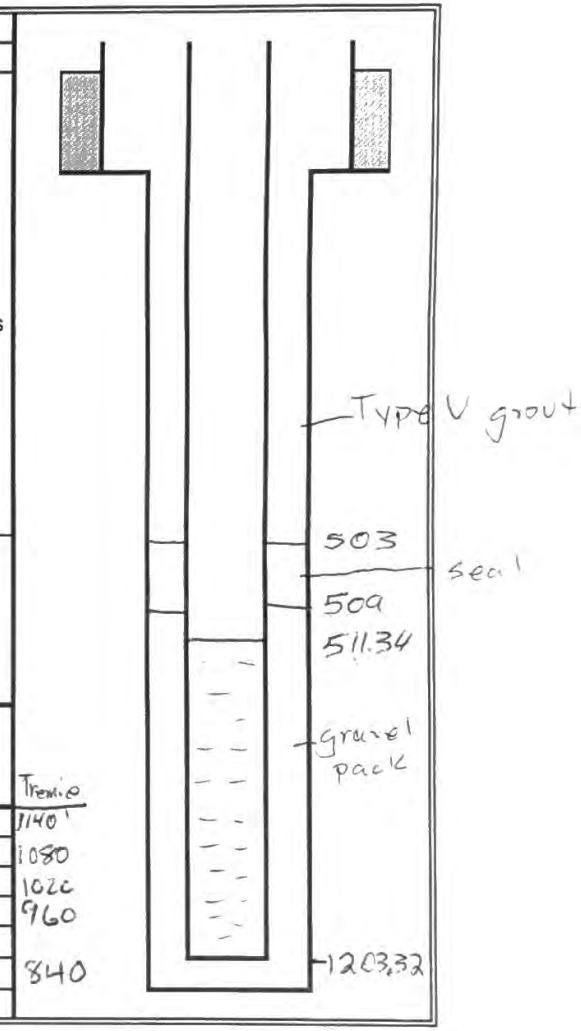
Total Depth of Borehole [T]:	1210	feet	Total Cased Depth:	1203.32	feet
Borehole Diameter [D]:	12.25	inches	Rat Hole Volume [R=(D^2) 0.005454*L_r]:	5.5	Ft^3
Screen Length [L_s]:	691.98	feet	Rat Hole Length [L_r]	6.7	feet
Screen Diameter [d_s]:	5.56	inches	Camera Tube Length [L_{ct}]	—	feet
Casing Length [L_c]	511.34	feet	Camera Tube Diameter [d_{ct}]	—	inches
Casing Diameter [d_c]	5.31	inches			

Screen Annular Volume (A_s): (D^2-d_s^2) 0.005454 = 0.65 Ft^3/Lin. Ft
Casing Annular Volume (A_c): (D^2-d_c^2) 0.005454 = 0.66 Ft^3/Lin. Ft
Casing/Cam.Tube Annular Volume (A_{c+ct}): (D^2-d_c^2-d_{ct}^2) 0.005454 = — Ft^3/Lin. Ft

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet
Bentonite Sack = 0.69 ft^3
[1] Volume of bag (Ft^3) = bag weight/100
Silica Sand Super Sack = 3000 lbs.
[2] Calculated depth = Previous Calculated depth - (v/A)

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1] (v) (ft^3)	Total Vol. of Bags (ft^3)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments
1	✓	3000	30	30	1165	1154	8x12 silica sand
2	✓	3000	30	60	1108	-	
3	✓	3000	30	90	1062	1068	
4	✓	3000	30	120	1022	-	
5	✓	3000	30	150	976	972	
6	✓	3000	30	180	926	-	
7	✓	3000	30	210	880	883	



ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FCI **Project No.:** 129687-005 **Geologist:** CPRICE / KFORD

Well No.: ~~009~~ 0-05 **Date:**

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1](v) (ft^3)	Total Vol. of Bags (ft^3)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments	TREMIE
8	✓	3000	30	240	837	-	8x12 SILICA SAND	780
9	✓	3000	30	270	791	"	↓	720
10	✓	3000	30	300	745	742		
11	✓	3000	30	330	696	659		660
12	✓	3000	30	360	613	608		600
13	✓	3000	30	390	562	559		540
14	✓	3000	30	420	513	506		480
—		-	-	-	-	538	SWAB 1200-600, 30 min/100'	
15	✓	1500	15	435	515	520	8x12 silica sand, 1/2 3000 lb super sack	480
16	✓		6.7	441.7	509.7	509	10 - 5 gal buckets 8x12 silica sand	480
—		—	—	—	—	511	swab 600-515, 30 min	
17	✓		1.4	443.1	509	509	2 - 5 gal buckets, 8x12 silica sand	480
18			4.4	447.5	502.3	503	Seal - choke sand w/ pell plug.	480
19	✓		162	609.5	257.5	290	15.4 lbs/gal Type V, cemex delivery 7 yards only 6 yards used.	480
		-	—	—	—	—		
20	✓		175.5	785	38.6	~~0~~	15.0 lbs/gal Type V, 6.5 yard load	285

Notes: Seal - Choke sand #60 silver sand, + 2 - 5 gal pell plug. = 1.34 ft^3 pell plug

HALEY ALDRICH

CEMEX

54717810

Used 6 Yards

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
[illegible]	227	243	334	340	456		

Customer Code: [illegible] Customer Name: FLORENCE COPPER INC
Customer Job Number: FLORENCE WELL Order Code / Date: [illegible]
Project Code: 1097304 Project Name: FLORENCE WELL
Project P.O. Number: NO Order P.O. Number: NO
Ticket Date: 06/02 [illegible] Delivery Address: 1575 W HUNT HIGHWAY
SPRING CRITICAL Map Page: Map/Row/Column: [illegible]
Delivery Instructions: HUNT HWY & E/ FELIX RD. MAX
Dispatcher: DRackley
Ticket Number: [illegible]

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:
15:[illegible]	11.00	10032183	[illegible]	HERNANDEZ, SAMUEL	[illegible]

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
7.00	26.00	38.00	1333049	TYPE II/V SLURRY 21 SK CMT/W YDS LEGAL MATERIAL NO:			
1.00			1247818	FUEL SURCHARGE ADJ			
.00			1202745	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT_NON TAXABLE_ARIZONA_			

JUN 2 PM 2:27

Cash / Check / Charge	Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:

Comments:

WATER ADDED: ________ GAL   YARDS IN DRUM: ________ WHEN ADDED.

SIGNATURE

CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST

SIGNATURE

LOAD WAS TESTED BY: Florence [illegible]

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING:** Product may cause skin and/or eye irritation. **CAUTION:** Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE ⓧ

68UNIVERSAL   PREV TRK: 10024080 GREENOUGH, EDWARD   **INVOICE**

Truck	Driver	User	Disp Ticket Num	Time Date
2183	411206	operator	44164992	14:14 6/2/17

Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
7.00 CYDS	1333049				D	22135

Matenal	Required	Batched	% Moisture	Actual	Wat	Trim
CEMENT	13860.00 lb	13870.00 lb				
WATER	816.9 gal	817.3 gal		817.3 gal		-10.00 gal

Actual Load 20690 lb Num Batches 2 Manual 14:14:53
Slump 3.00 in Design W/C 0.534 Water/Cement 0.492 A Actual 817.3 gal To Add 69.6 g

Load Completed Load Time: 19:04 ---Tares----------

CEM SCALE	B: 1	ST:	0 lb	ET:	-5 lb	WAT SCALE	B: 1	ST:	0
WAT SCALE	B: 2	ST:	2 lb	ET:	2 lb				

CEMEX

53674757

Used Full load.

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
01* 3171							

Customer Code:	Customer Name:	Customer Job Number:	Order Code / Date:
3181157	FLORENCE COPPER INC	FLORENCE WELL	0427 06/05/17

Project Code:	Project Name:	Project P.O. Number:	Order P.O. Number:
41097304	FLORENCE WELL	NO	NO

Ticket Date:	Delivery Address:		Map Page: Map/Row/Column
06/05/17	1575 W HUNT HIGHWAY	BATCH RECORDS/CEM * U	PIN FINDS201

Delivery Instructions: HUNT HWY & E/ FELIX RD. MAX

Dispatcher: vstewart

Ticket Number: 44165174

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:
05:00	11.00	10065248	410512	DENDY, BRUCE E	SLT BLDNG OTHER

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
6.50	6.50	13.00	1333049	TYPE II/V SLURRY 21 SK CMT/W LEGACY MATERIAL NO:	YD3		
1.00	1.00	1.00	1349068	PER DAY DELIVERY	EA		
1.00			1247818	FUEL SURCHARGE ADJ			
1.00			1202749	ENVIRONMENTAL FEE			
1.00			1572392	FREIGHT NON TAXABLE ARIZONA			

JL*5117*17

☐ Cash ☐ Check ☐ Charge	Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:

Comments:

WATER ADDED: ________ GAL YARDS IN DRUM WHEN ADDED: ________

________ SIGNATURE

CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:

________ SIGNATURE

☐ LOAD WAS TESTED BY: ________

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING:** Product may cause skin and/or eye irritation. **CAUTION:** Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE

ⓧ

PREV TRK:

LOAD NUM:

68UNIVERSAL

CUSTOMER

Truck	Driver	User	Disp Ticket Num	Time	Date
5248	410512	operator	44165774	4:04	6/5/17

Load Size	Mix Code	Returned	Qty	Mix Age	Seq	Load ID
6.50 CYDS	1333049				D1	97127

Material	Required	Batched		% Moisture	Actual	Wat	Trim
CEMENT	12870.00 lb	12900.00 lb	>				
WATER	823.55 gal	824.21 gal			824.21 gl		gl

Actual Load 19778 lb Num Batches: 2 Manual 4:04:13
Slump: 3.00 in Design W/C: 0.534 Water/Cement: 0.533 A Actual 824.2 gl To Add: 0.0 gl

Load Completed Load Time: :

---Tares---

CEM SCALE	B:	1	ST:	50	lb	+	ET:	25	lb	WAT SCALE	B: 1 ST: 0
WAT SCALE	B:	2	ST:	2	lb		ET:	0	lb		

PIPE TALLY

Project Name.:	FCI	Project No.:	129687-005
Well No.:	O 05	Date:	5-30-17
Location:		Pipe Talley for:	CASING
Total Depth:	1210	Geologist:	VFORD

Type of Connections: ☐ Welded ☐ T+C ☒ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor (bottom) to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
1	✓ *	20.52	20.52	PVC SCREEN	1.48/3.56	ERT	10		1200.50
2	✓	19.99	40.51		-				
3	✓ *	20.05	60.56		-				
4	✓	20.07	80.63		16.09/18.16	ERT	9		1175.33
5	✓ *	20.08	100.71		-				
6	✓	20.07	120.78		-				
7	✓ *	20.03	140.81		-				
8	✓	20.07	160.88		11.09/13.16	ERT	8		1050.08
9	✓ *	20.07	180.95		-				
10	✓	20.08	201.03		-				
11	✓ *	19.99	221.02		-				
12	✓	20.07	241.09		6.02/8.18	ERT	7		974.67
13	✓ *	19.99	261.08		-				
14	✓	20.08	281.16		-				
15	✓ *	19.99	301.15		-				
16	✓	20.05	321.20		0.90/3.05	ERT	6		899.93
17	✓ *	20.05	341.25		-				
18	✓	20.08	361.33		-				
19	✓ *	20.07	381.40		16.07/18.17	ERT	5		824.58
20	✓	20.04	401.44		-				
21	✓ *	20.05	421.49		-				
22	✓	20.04	441.53		-				
23	✓ *	20.04	461.57		11.16/13.19	ERT	4		749.29
24	✓	20.02	481.59		-				
25	✓ *	20.04	501.63		-				
26	✓	20.04	521.67		-				
27	✓ *	20.04	541.71		6.15/8.20	ERT	3		674.16
28	✓	20.04	561.75						
29	✓ *	20.04	581.79						
30	✓	20.04	601.83						

sensor [bottom/top]

Notes:

Joint #1 is screen + end cap.

* = Centralizer at bottom of joint unless otherwise noted

SUMMARY OF TALLY

Total Length tallied:	1204.89
Casing Stick-Up:	1.57
Length of Casing Cut-Off:	0
Bottom of Well:	1203.32
Screened Interval:	1203.32 - 511.34
Total Screen in Hole:	691.98'

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
Conductivity Sensor (CS) single sensor with sing lead 20 ft spacing
Operational Monitoring Sensor (OMS)

HALEY ALDRICH

HALEY ALDRICH

PIPE TALLY

Project Name.:	FCI	Project No.:	129687-005
Well No.:	O-05	Date:	5-30-17
Location:		Pipe Talley for:	Casing
Total Depth:	1210	Geologist:	K Ford & C Price

Type of Connections: ☐ Welded ☐ T+C ☐ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
31	✓ X	20.03	621.86	PVC Screen	0.95/3.02	ERT	2		599.20
32	✓	20.03	641.89	↓	—				
33	✓ X	20.02	661.91	↓	—				
34	✓	20.04	681.95	↓	16.02/18.09	ERT	1		524.05
35	✓ X	10.03	691.98	↓					
36	✓	0.50	692.48	crossover					
37	✓ X	28.98	721.46	Fiberglass	27.50	CS	4		482.00 cable 5
38	✓ X	28.97	750.43		27.32	CS	3, 2, 1		453.20
39	✓ X	28.98	779.41		9.55	CS	(4), 3,		442.00, cable 6
40	✓	28.97	808.38		0.60	CS	(2), 1		
41	✓ X	28.97	837.35						
42	✓ X	28.97	866.32						
43	✓ X	28.96	895.28						
44	✓	29.10	924.38						
45	✓ X	29.07	953.45		4.60, 7.60	CS	2, 1		273, 270
46	✓ X	28.97	982.42						
47	✓ X	28.99	1011.41						
48	✓	29.00	1040.41						
49	✓ X	29.02	1069.43						
50	✓ X	29.02	1098.45						
51	✓ X	29.23	1127.68						
52	✓	29.22	1156.90						
53	✓ X	29.32	1186.22						
54	✓	10.14	1196.36						
55	✓ X	5.17	1201.53						
56	✓	1.68	1203.21						
57	✓	1.68	1204.89						

Notes:
X - centralizer or pipe, 40' spacing. X

SUMMARY OF TALLY

Total Length tallied:	
Casing Stick-Up:	
Length of Casing Cut-Off:	
Bottom of Well:	
Screened Interval:	
Total Screen in Hole:	

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
Conductivity Sensor (CS) single sensor with sing lead 20 ft spacing
Operational Monitoring Sensor (OMS)

HALEY ALDRICH

HALEY ALDRICH

HALEY ALDRICH

MEETING SUMMARY

Route To:

Project FCI

Topic

Meeting Location O-05

Attendees (Name/Firm)

Drop all depths by 1.34'

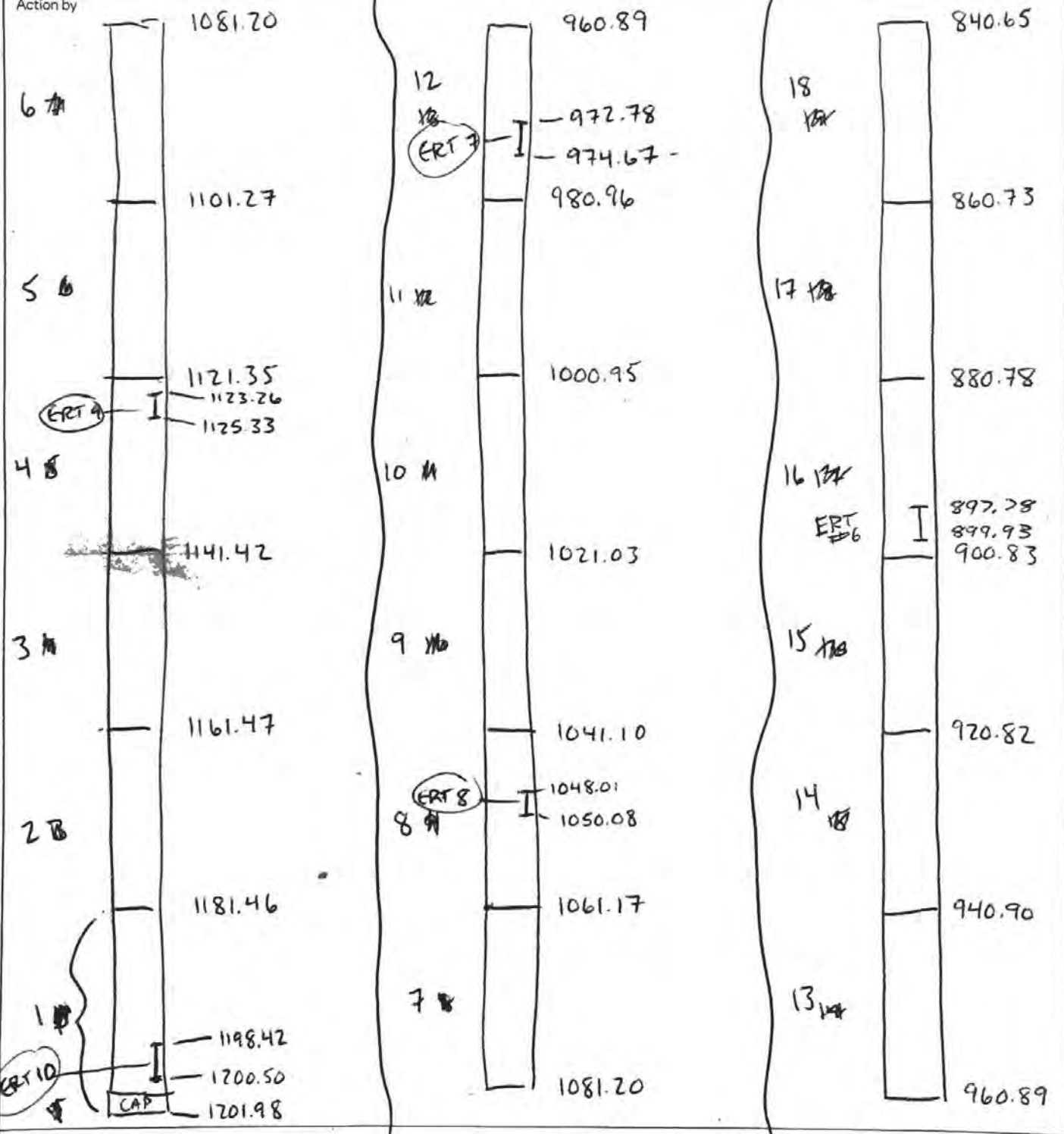
File No 129687-005

Date 5-30 17

Time to

Sheet 1 of 3

Action by



Prepared by

MMP_HAMeetingSummary 12Feb2015

HALEY ALDRICH

MEETING SUMMARY

Route To: _____

Project FCI

Topic _____

Meeting Location O-05

Attendees (Name/Firm) _____

Drop all depths by 1.34'

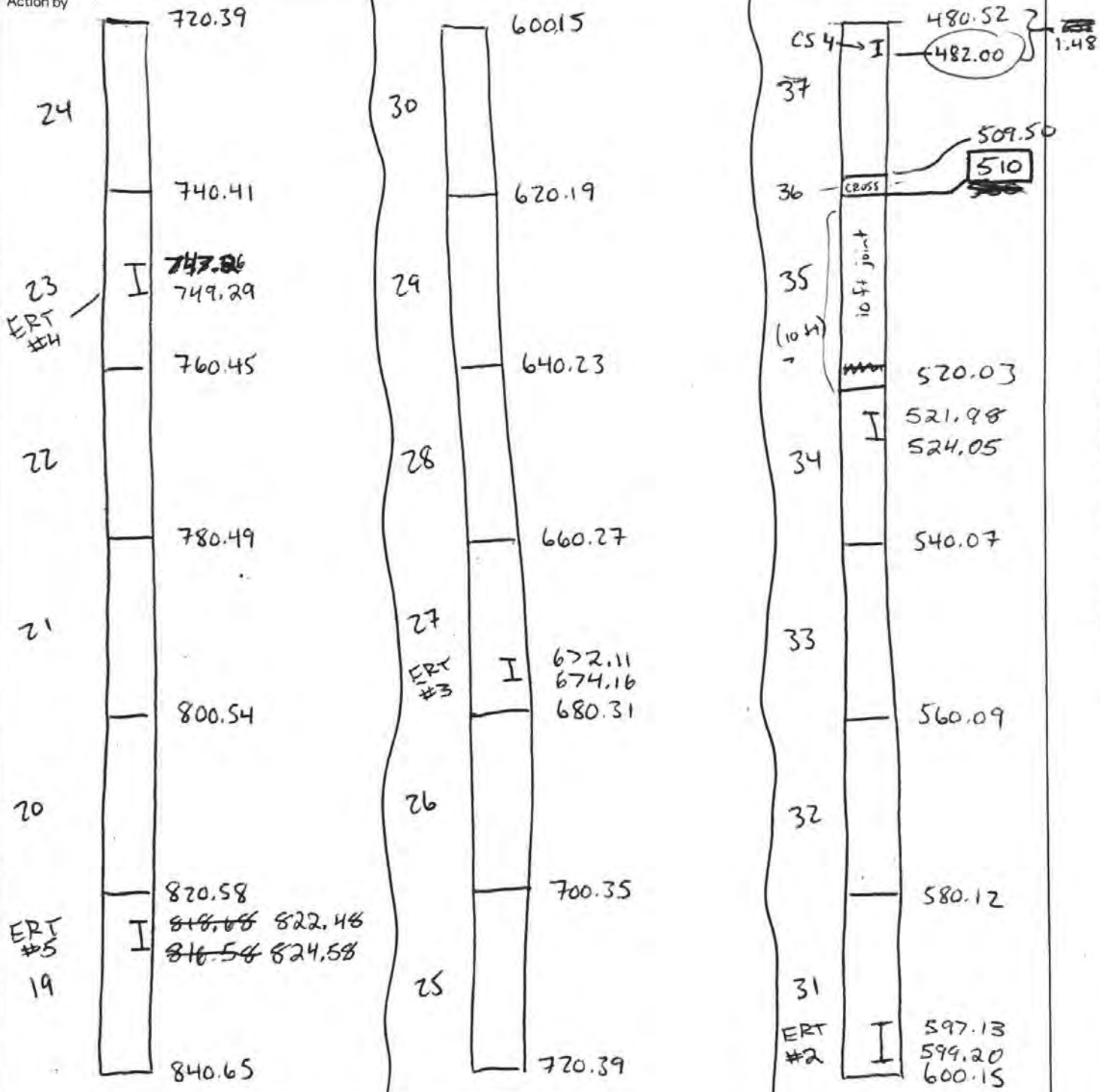
File No. 129687-005

Date 5-30-17

Time _____ to _____

Sheet 2 of 3

Action by



Prepared by _____

MMP_HAMeetingSummary 12Feb2015

100% Post-consumer waste

HALEY ALDRICH

MEETING SUMMARY

Route To

Project FCI

Topic

Meeting Location 0.05

Attendees (Name/Firm)

Drop all measurement down. 1.34'

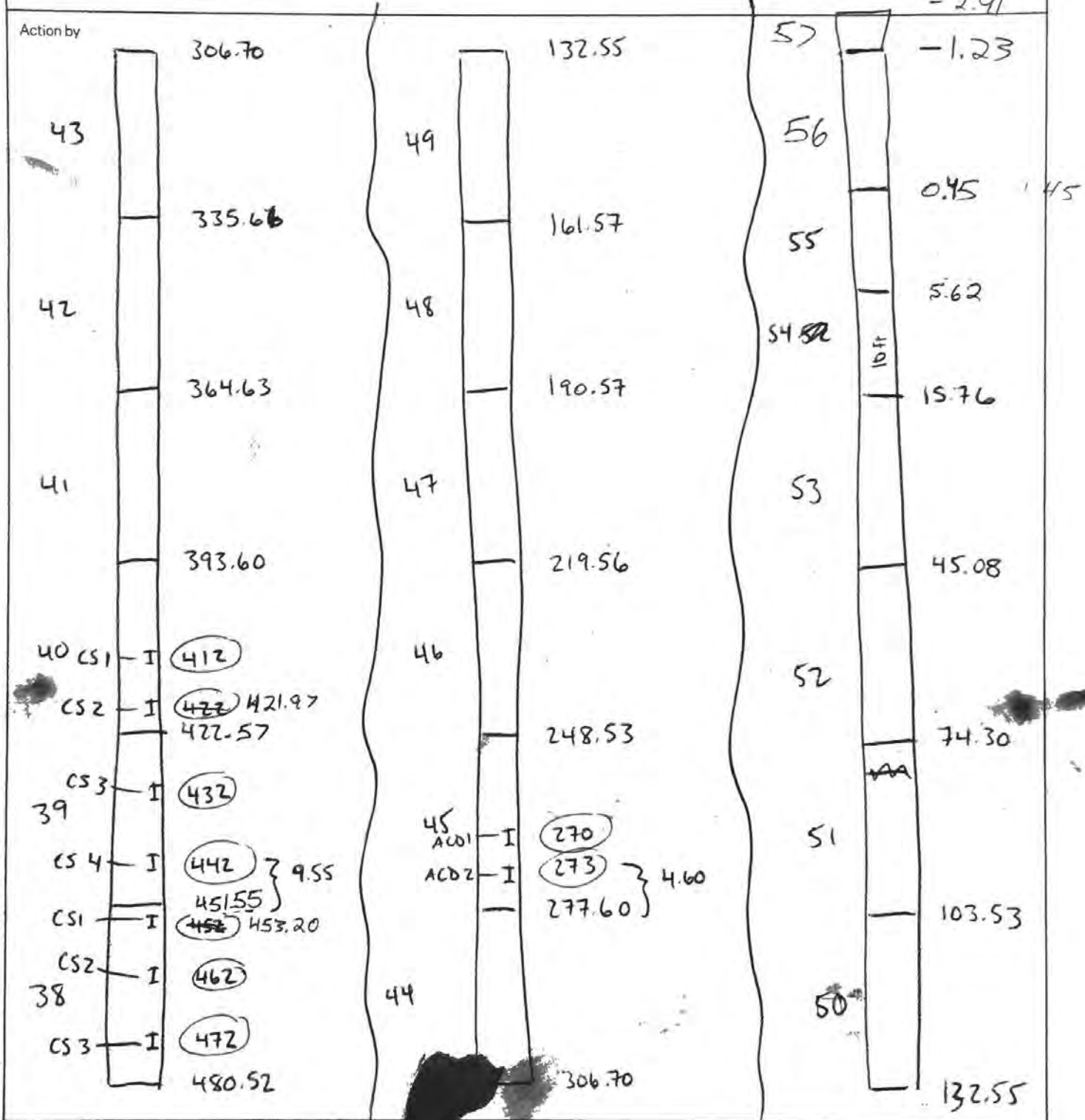
File No. 129687.005

Date 5-30-17

Time ____ to ____

Sheet 3 of 3

Action by



Prepared by

MMP_HAMeetingSummary 12Feb2015

H39 in place of H38

100% Post-consumer waste

APPENDIX K

Well O-05 Abandonment Records

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	O-05
FIELD	FLORENCE COPPER
COUNTY	PINAL STATE ARIZONA

TYPE OF LOGS: 4 RX SONIC
MORE: GAMMA - CALIPER
LOCATION

SEC TWP RGE

OTHER SERVICES
DUAL DENSITY
4 PI DENSITY
TEMPERATURE
ACOUSTIC TELEVIEWER

PERMANENT DATUM	ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL	G.L.

DATE	06-06-17	TYPE FLUID IN HOLE	FORMATION WATER
RUN No	1 & 4	MUD WEIGHT	N/A
TYPE LOG	SONIC - GAMMA - CALIPER	VISCOSITY	N/A
DEPTH-DRILLER	1203.0 FT	LEVEL	~ 262.0 FT.
DEPTH-LOGGER	1196.0 FT.	MAX. REC. TEMP.	39.38 DEG. C
BTM LOGGED INTERVAL	560.0 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	250.0 FT.	SAMPLE INTERVAL	0.25 FT.
DRILLER / RIG#	NATIONAL DRILLING	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	A. OLSON / M. QUINONES	TOOL STRING/SN	ALT 4 RX SONIC SN 5185
WITNESSED BY	CHAD - H & A	LOG TIME:ON SITE/OFF SITE	3:00 P.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	12 1/4 IN.	SURFACE	TOTAL DEPTH	5 IN.	F. GLASS	SURFACE	511 FT.
2				5 IN.	PVC	511 FT.	TOTAL DEPTH
3							

COMMENTS:

.

Tool Summary:

Date	06-06-17	**Date**	06-06-17	**Date**	06-06-17		
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	MSI COMBO TOOL	**Tool Model**	MSI DENSITY	**Tool Model**	COMPROBE 4 PI		
Tool SN	4953	**Tool SN**	3083	**Tool SN**	6009		
From	SURFACE	**From**	SURFACE	**From**	250.0 FT.		
To	1196.0 FT.	**To**	560.0 FT.	**To**	560.0 FT.		
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON		
Truck No	310	**Truck No**	310	**Truck No**	310		
Operation Check	06-05-17	**Operation Check**	06-05-17	**Operation Check**	06-05-17		
Calibration Check	06-05-17	**Calibration Check**	N/A	**Calibration Check**	N/A		
Time Logged	3:05 P.M.	**Time Logged**	4:15 P.M.	**Time Logged**	4:45 P.M.		
Date	06-06-17	**Date**	06-06-17	**Date**			
Run No.	4	**Run No.**	5	**Run No.**	6		
Tool Model	ALT 4 RX SONIC	**Tool Model**	ALT QL ABI40 2G	**Tool Model**			
Tool SN	5185	**Tool SN**	143002	**Tool SN**			
From	SURFACE	**From**	260.0 FT.	**From**			
To	560.0 FT.	**To**	1192.0 FT.	**To**			
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**			
Truck No	310	**Truck No**	310	**Truck No**			
Operation Check	06-05-17	**Operation Check**	06-05-17	**Operation Check**			
Calibration Check	N/A	**Calibration Check**	N/A	**Calibration Check**			
Time Logged	5:15 P.M.	**Time Logged**	6:00 P.M.	**Time Logged**			

Additional Comments:

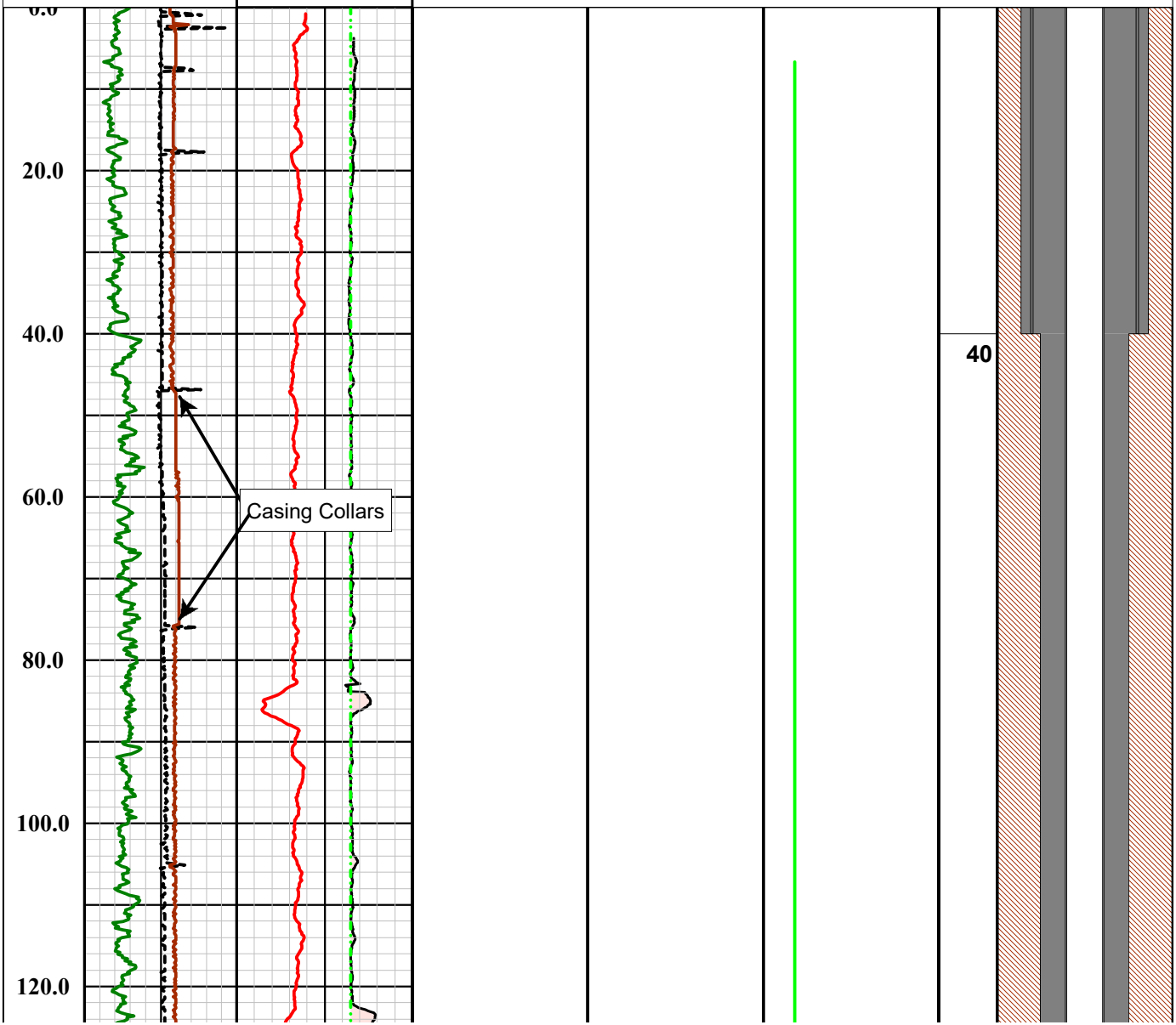
Caliper Arms Used: 3" **Calibration Points:** 2" & 4"

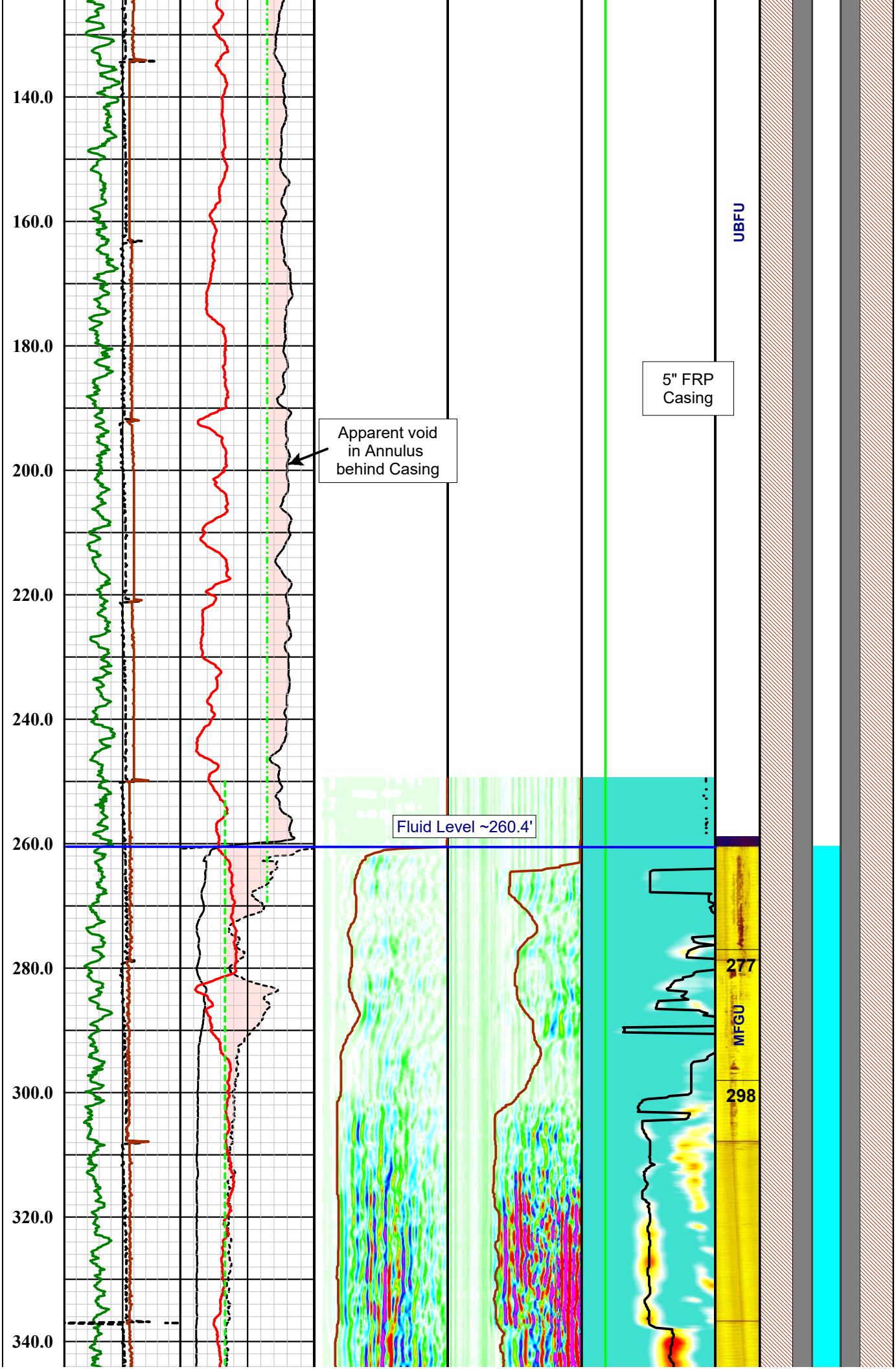
E-Log Calibration Range: N/A **Calibration Points:** N/A

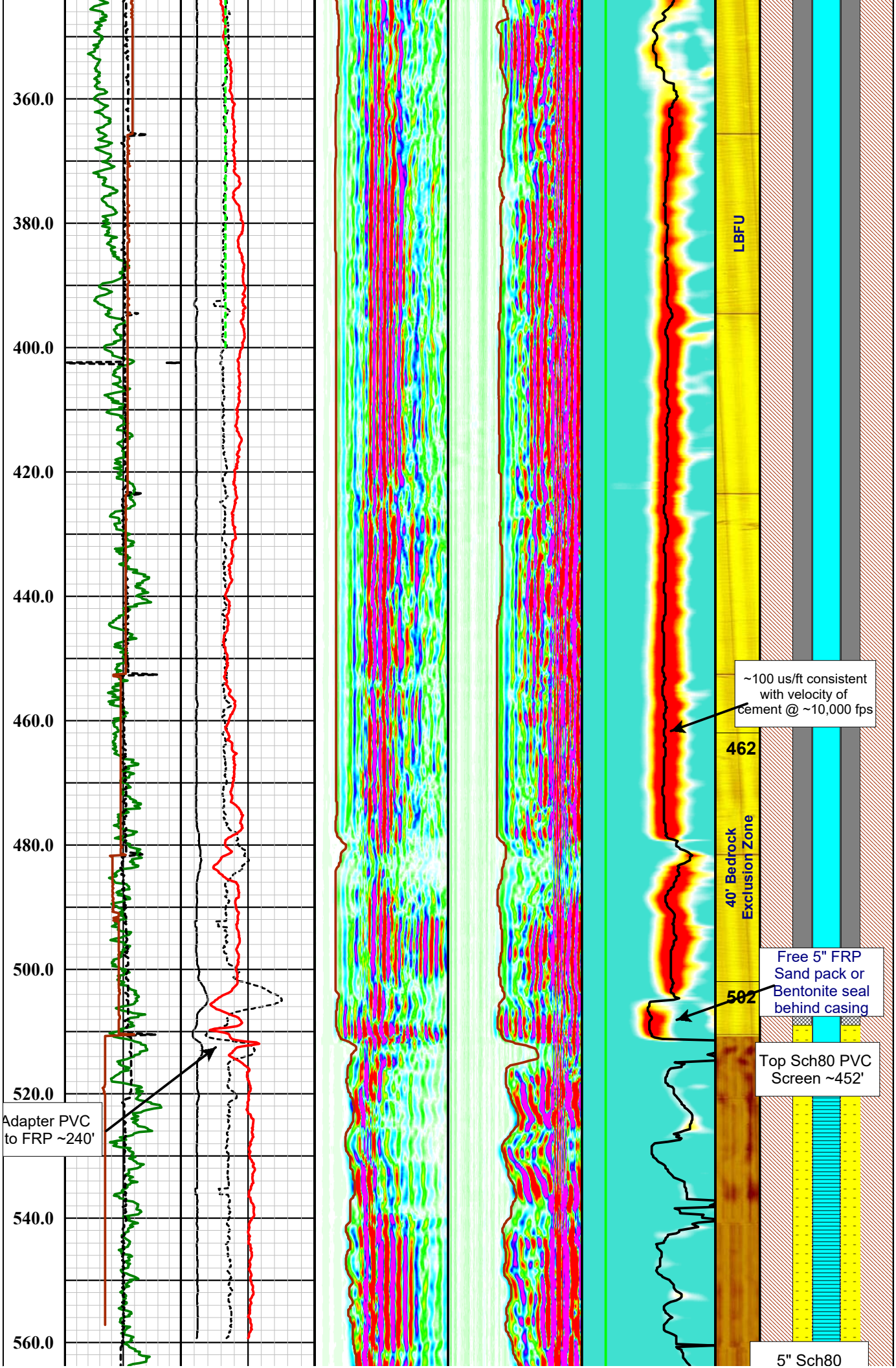
Disclaimer:

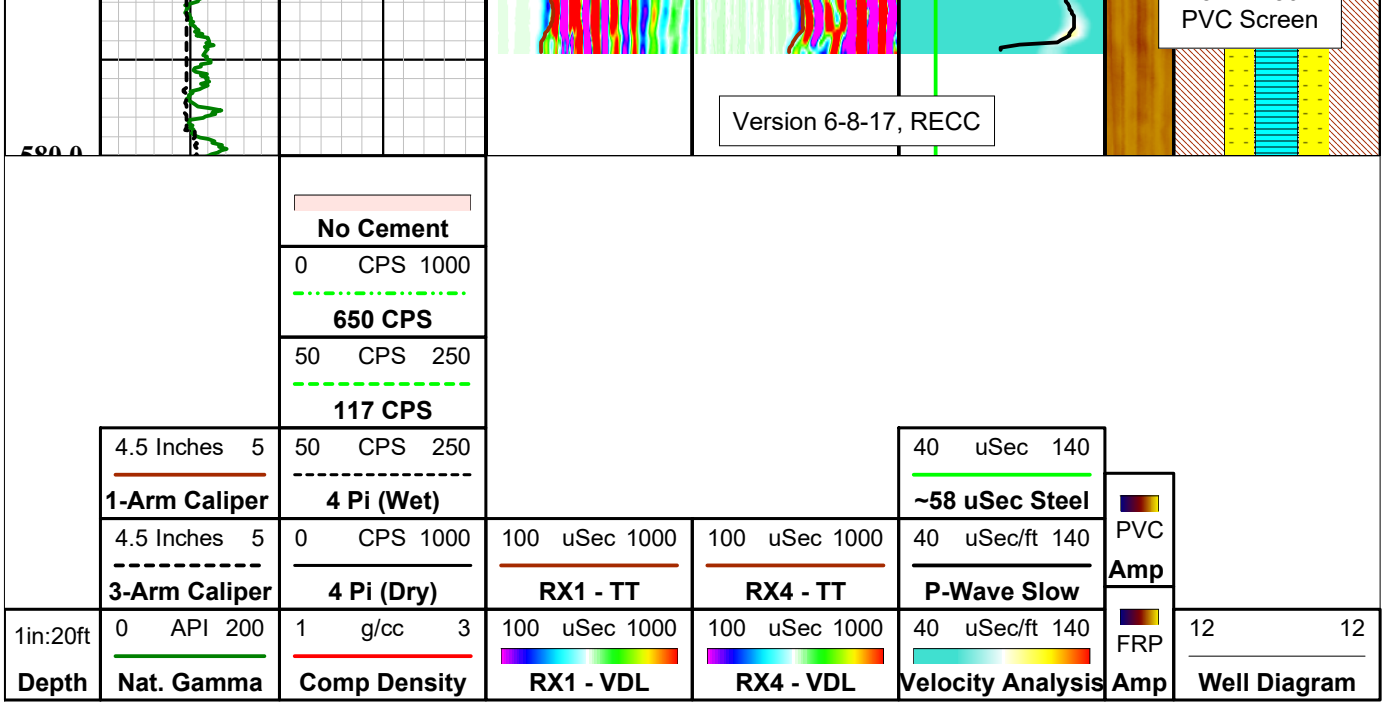
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

Depth	Nat. Gamma	Comp Density	RX1 - VDL	RX4 - VDL	Velocity Analysis	Amp	Well Diagram
1in:20ft	0 API 200	1 g/cc 3	100 uSec 1000	100 uSec 1000	40 uSec/ft 140	FRP	12 12
	3-Arm Caliper	4 Pi (Dry)	RX1 - TT	RX4 - TT	P-Wave Slow	Amp PVC	
	4.5 Inches 5	0 CPS 1000	100 uSec 1000	100 uSec 1000	40 uSec/ft 140		
	1-Arm Caliper	4 Pi (Wet)			~58 uSec Steel		
	4.5 Inches 5	50 CPS 250			40 uSec 140		
		117 CPS					
		50 CPS 250					
		650 CPS					
		0 CPS 1000					
		No Cement					




140.0
160.0
180.0
200.0
220.0
240.0
260.0
280.0
300.0
320.0
340.0
Apparent void
in Annulus
behind Casing
5" FRP
Casing
UBFU
Fluid Level ~260.4'
277
MFGU
298


360.0
380.0
400.0
420.0
440.0
460.0
480.0
500.0
520.0
540.0
560.0
LBFU
~100 us/ft consistent with velocity of cement @ ~10,000 fps
462
40' Bedrock Exclusion Zone
Free 5" FRP Sand pack or Bentonite seal behind casing
502
Top Sch80 PVC Screen ~452'
Adapter PVC to FRP ~240'
5" Sch80



FWS50-4Rx Full Waveform Sonic Tool SN 5185

Probe Top = Depth Ref.

Four Conductor MSI Probe Top

Probe Length = 2.71 m or 8.9 ft
Probe Weight = ~18.0 kg or 39.6 lbs

Sensors: Ceramic Piezoelectric in Polyurethane potting

Transmitter Frequency: ~20 kHz resonant frequency

Rx - Rx Spacing: 0.2 m (7.9 in)

Typically ran centralized with external bow spring centralizers.

Can only be collected in fluid.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Rx-4 **Tx - Rx4 Spacing = 1.2 m (47.2 in)**

Rx-3 **Tx - Rx3 Spacing = 1.0 m (39.4 in)**

Rx-2 **Tx - Rx2 Spacing = 0.8 m (31.5 in)**

Rx-1 Tx - Rx1 Spacing = 0.6 m (23.6 in)

Acoustic Isolater

Tx = Acoustic Transmitter

0.155 m or 6.25 in. - End of tool to center of Tx

1.97" or 50 mm Diameter

4 Pi Density Tool SN 6009

Probe Top = Depth Ref.

Four Conductor Probe Top

Probe Length = 1.57 m or 5.17 ft
Probe Weight = 4.99 kg or 11.0 lbs

Uses an Cs 137 Radioactive Source
Detector Assembly: Nal crystal with Photo-tube

Temperature Rating: 107 Deg C (225 Deg F)

Pressure Rating: 344.7 bar (5000 psi)

1.25 in or 31.75 mm Diameter

MSI 2GDA Density

Probe Top = Depth Ref.

Tool SN: 3082, 3925, & 5273

Single Conductor MSI Probe Top

Probe Length = 3.20 m or 10.50 ft
Probe Weight = 17.3 kg or 38.14 lbs

2GDA can only be collected logging up hole due to the caliper.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Guard Resistivity = 1.11 m (43.74 in)

1-Arm Caliper = 0.79 m (31.0 in)

Decentralization Band

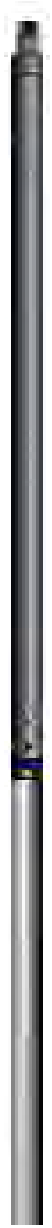
Near/Far Detectors

Source

1.60" or 41.0 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity SN 4953

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	O-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Cement Bond Log Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	O-05
FIELD	FLORENCE COPPER
COUNTY	PINAL STATE ARIZONA

TYPE OF LOGS: DUAL DENSITY
MORE: 4 PI DENSITY
LOCATION

SEC TWP RGE

OTHER SERVICES
NAT. GAMMA
3-ARM CALIPER
TEMPERATURE
SONIC
ACOUSTIC TELEVIEWER

PERMANENT DATUM	ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL	G.L.

DATE	06-06-17	TYPE FLUID IN HOLE	FORMATION WATER
RUN No	2 & 3	MUD WEIGHT	N/A
TYPE LOG	DUAL DENSITY - 4 PI	VISCOSITY	N/A
DEPTH-DRILLER	1203.0 FT	LEVEL	~ 262.0 FT.
DEPTH-LOGGER	1196.0 FT.	MAX. REC. TEMP.	39.38 DEG. C
BTM LOGGED INTERVAL	1196.0 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	NATIONAL DRILLING	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	A. OLSON / M. QUINONES	TOOL STRING/SN	MSI 2GDA SN 3083
WITNESSED BY	CHAD - H & A	LOG TIME:ON SITE/OFF SITE	3:00 P.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	12 1/4 IN.	SURFACE	TOTAL DEPTH	5 IN.	F. GLASS	SURFACE	511 FT.
2				5 IN.	PVC	511 FT.	TOTAL DEPTH
3							

COMMENTS:

.

Tool Summary:

Date	06-06-17	**Date**	06-06-17	**Date**	06-06-17		
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	MSI COMBO TOOL	**Tool Model**	MSI DENSITY	**Tool Model**	COMPROBE 4 PI		
Tool SN	4953	**Tool SN**	3083	**Tool SN**	6009		
From	SURFACE	**From**	SURFACE	**From**	250.0 FT.		
To	1196.0 FT.	**To**	560.0 FT.	**To**	560.0 FT.		
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON		
Truck No	310	**Truck No**	310	**Truck No**	310		
Operation Check	06-05-17	**Operation Check**	06-05-17	**Operation Check**	06-05-17		
Calibration Check	06-05-17	**Calibration Check**	N/A	**Calibration Check**	N/A		
Time Logged	3:05 P.M.	**Time Logged**	4:15 P.M.	**Time Logged**	4:45 P.M.		

Date	06-06-17	**Date**	06-06-17	**Date**			
Run No.	4	**Run No.**	5	**Run No.**	6		
Tool Model	ALT 4 RX SONIC	**Tool Model**	ALT QL ABI40 2G	**Tool Model**			
Tool SN	5185	**Tool SN**	143002	**Tool SN**			
From	SURFACE	**From**	260.0 FT.	**From**			
To	560.0 FT.	**To**	1192.0 FT.	**To**			
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**			
Truck No	310	**Truck No**	310	**Truck No**			
Operation Check	06-05-17	**Operation Check**	06-05-17	**Operation Check**			
Calibration Check	N/A	**Calibration Check**	N/A	**Calibration Check**			
Time Logged	5:15 P.M.	**Time Logged**	6:00 P.M.	**Time Logged**			

Additional Comments:

Caliper Arms Used: 3" **Calibration Points:** 2" & 4"

E-Log Calibration Range: N/A **Calibration Points:** N/A

Disclaimer:

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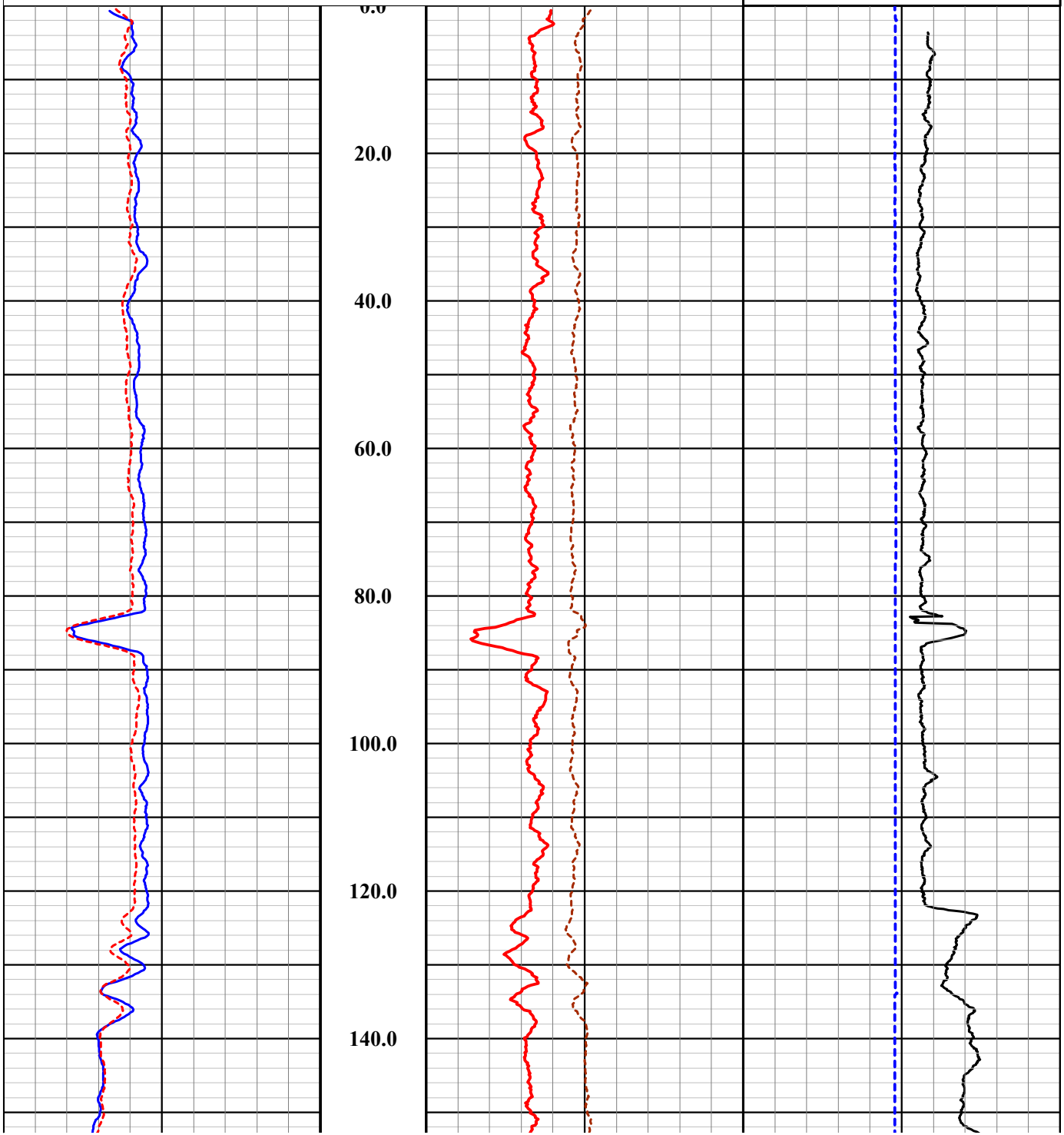
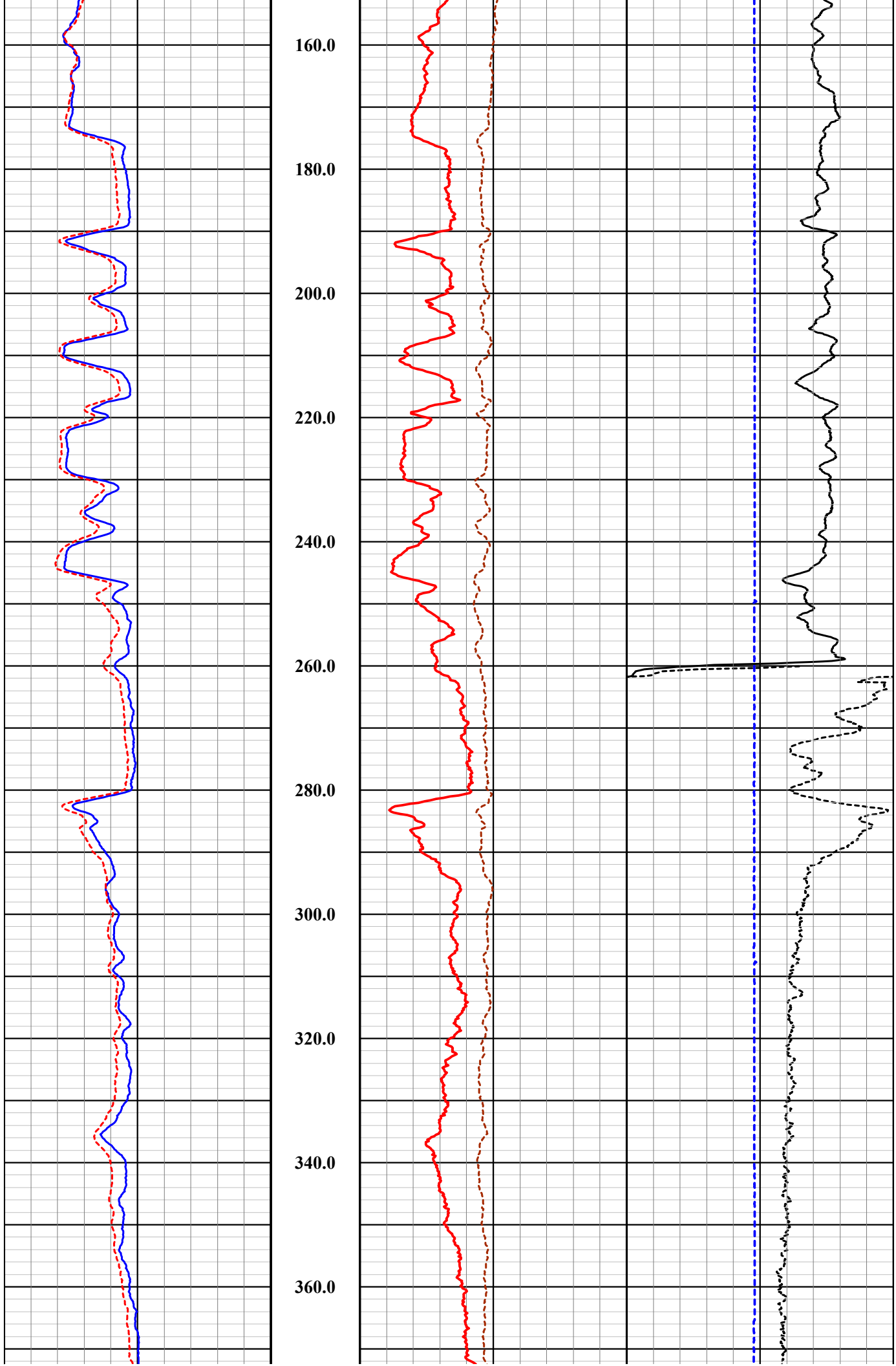
Near Density	Depth	Compensated Density	1-Arm Caliper
1 g/cc 3	1in:20ft	1 g/cc 3	0 Inches 10
Far Density		**Compensation**	**4 Pi Density (Dry)**
1 g/cc 3		-2 g/cc 2	200 CPS 1000
			4 Pi Density (Wet)
			0 CPS 200

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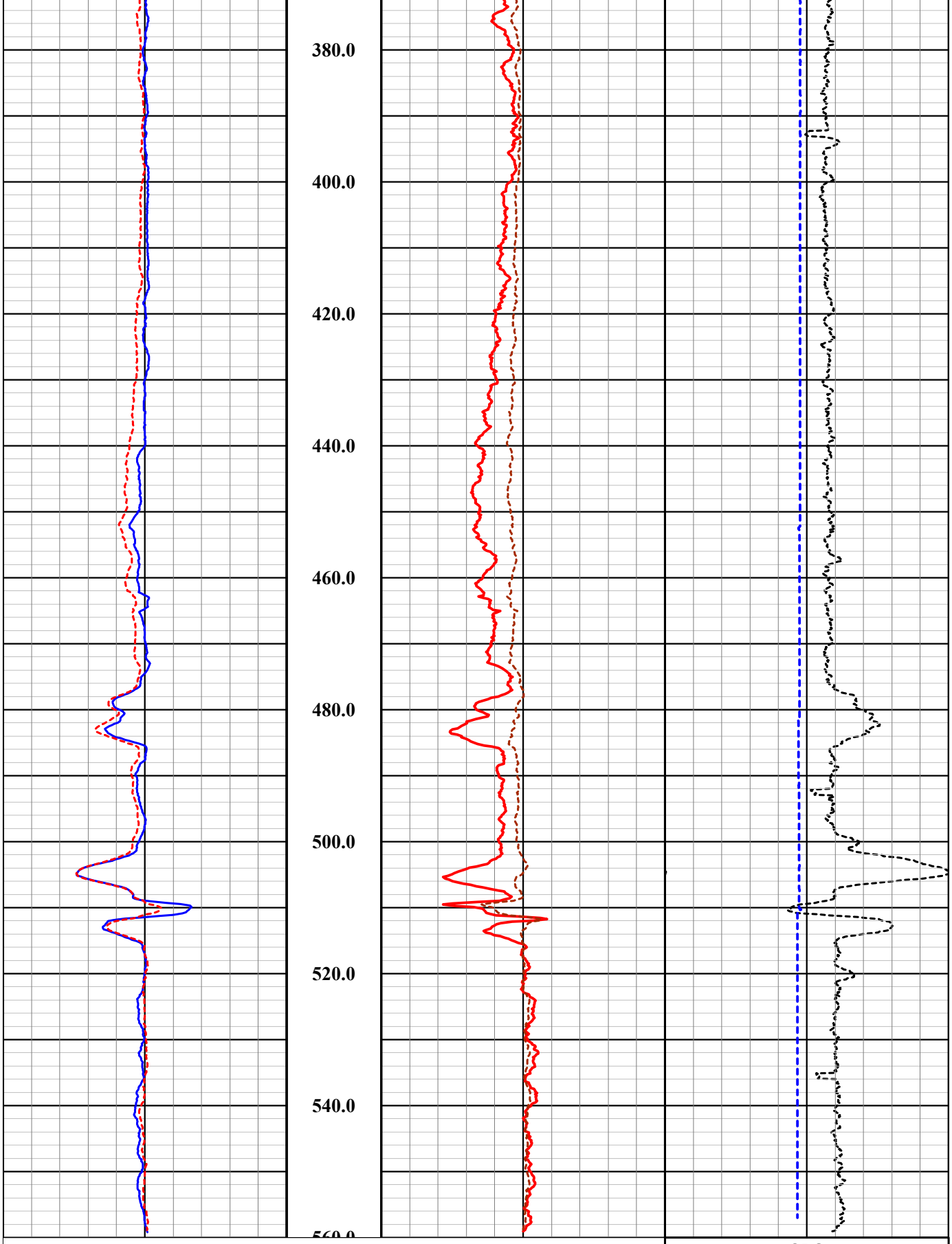
360.0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460.0
480.0
500.0
520.0
540.0
0
CPS
200
4 Pi Density (Wet)
1
g/cc
3
Far Density
-2
g/cc
2
Compensation
200
CPS
1000
4 Pi Density (Dry)
1
g/cc
3
Near Density
1in:20ft
Depth
1
g/cc
3
Compensated Density
0
Inches
10
1-Arm Caliper

MSI 2GDA Density

Probe Top = Depth Ref.

Tool SN: 3082, 3925, & 5273

Single Conductor MSI Probe Top

Probe Length = 3.20 m or 10.50 ft
Probe Weight = 17.3 kg or 38.14 lbs

2GDA can only be collected logging up hole due to the caliper.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Guard Resistivity = 1.11 m (43.74 in)

1-Arm Caliper = 0.79 m (31.0 in)

Decentralization Band

Near/Far Detectors

Source

Source

1.60" or 41.0 mm Diameter

4 Pi Density Tool SN 6009

Probe Top = Depth Ref.

Probe Length = 1.57 m or 5.17 ft
Probe Weight = 4.99 kg or 11.0 lbs

Uses an Cs 137 Radioactive Source
Detector Assembly: Nal crystal with Photo-tube

Temperature Rating: 107 Deg C (225 Deg F)

Pressure Rating: 344.7 bar (5000 psi)

1.25 in or 31.75 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	O-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

State	ARIZONA

Final **Dual Density - 4 Pl Summary**

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	O-05
FIELD	FLORENCE COPPER
COUNTY	PINAL STATE ARIZONA

TYPE OF LOGS: DUAL DENSITY
MORE: 4 PI DENSITY

LOCATION

SEC TWP RGE

OTHER SERVICES
SONIC

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	6-12-17	TYPE FLUID IN HOLE	FORMATION WATER
RUN No	1 & 3	MUD WEIGHT	N/A
TYPE LOG	DUAL DENSITY-4 PI DENS.	VISCOSITY	N/A
DEPTH-DRILLER	1203 FT	LEVEL	~ 250 FT
DEPTH-LOGGER	1196 FT	MAX. REC. TEMP.	N/A
BTM LOGGED INTERVAL	560 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	NATIONAL DRILLING	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	M. QUINONES / E. TURNER	TOOL STRING/SN	MSI 2GDA SN 3083
WITNESSED BY	NATIONAL	LOG TIME:ON SITE/OFF SITE	10:20 AM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	12 1/4 IN.	SURFACE	TOTAL DEPTH	5 IN.	F. GLASS	SURFACE	511 FT
2				5 IN.	PVC	511 FT	TOTAL DEPTH
3							

COMMENTS:

.

Tool Summary:

Date	6-12-17	**Date**	6-12-17	**Date**	6-12-17			**Date**	
Run No.	1	**Run No.**	2	**Run No.**	3			**Run No.**	6
Tool Model	MSI 2GDA	**Tool Model**	ALT 4 RX SONIC	**Tool Model**	COMPROB 4 PI			**Tool Model**	
Tool SN	3083	**Tool SN**	5185	**Tool SN**	6009			**Tool SN**	
From	SURFACE	**From**	278 FT	**From**	SURFACE			**From**	
To	560 FT	**To**	560 FT	**To**	560 FT			**To**	
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	M. QUINONES			**Recorded By**	
Truck No	310	**Truck No**	310	**Truck No**	310			**Truck No**	
Operation Check	6-12-17	**Operation Check**	6-12-17	**Operation Check**	6-12-17			**Operation Check**	
Calibration Check	6-12-17	**Calibration Check**	N/A	**Calibration Check**	N/A			**Calibration Check**	
Time Logged	10:45 AM	**Time Logged**	11:25 AM	**Time Logged**	11:45 AM			**Time Logged**	
Date		**Date**		**Date**		**Date**		**Date**	
Run No.	4	**Run No.**	5	**Run No.**		**Run No.**		**Run No.**	6
Tool Model		**Tool Model**		**Tool Model**		**Tool Model**		**Tool Model**	
Tool SN		**Tool SN**		**Tool SN**		**Tool SN**		**Tool SN**	
From		**From**		**From**		**From**		**From**	
To		**To**		**To**		**To**		**To**	
Recorded By		**Recorded By**		**Recorded By**		**Recorded By**		**Recorded By**	
Truck No		**Truck No**		**Truck No**		**Truck No**		**Truck No**	
Operation Check		**Operation Check**		**Operation Check**		**Operation Check**		**Operation Check**	
Calibration Check		**Calibration Check**		**Calibration Check**		**Calibration Check**		**Calibration Check**	
Time Logged		**Time Logged**		**Time Logged**		**Time Logged**		**Time Logged**	

Additional Comments:

Caliper Arms Used: N/A **Calibration Points:** N/A

E-Log Calibration Range: N/A **Calibration Points:** N/A

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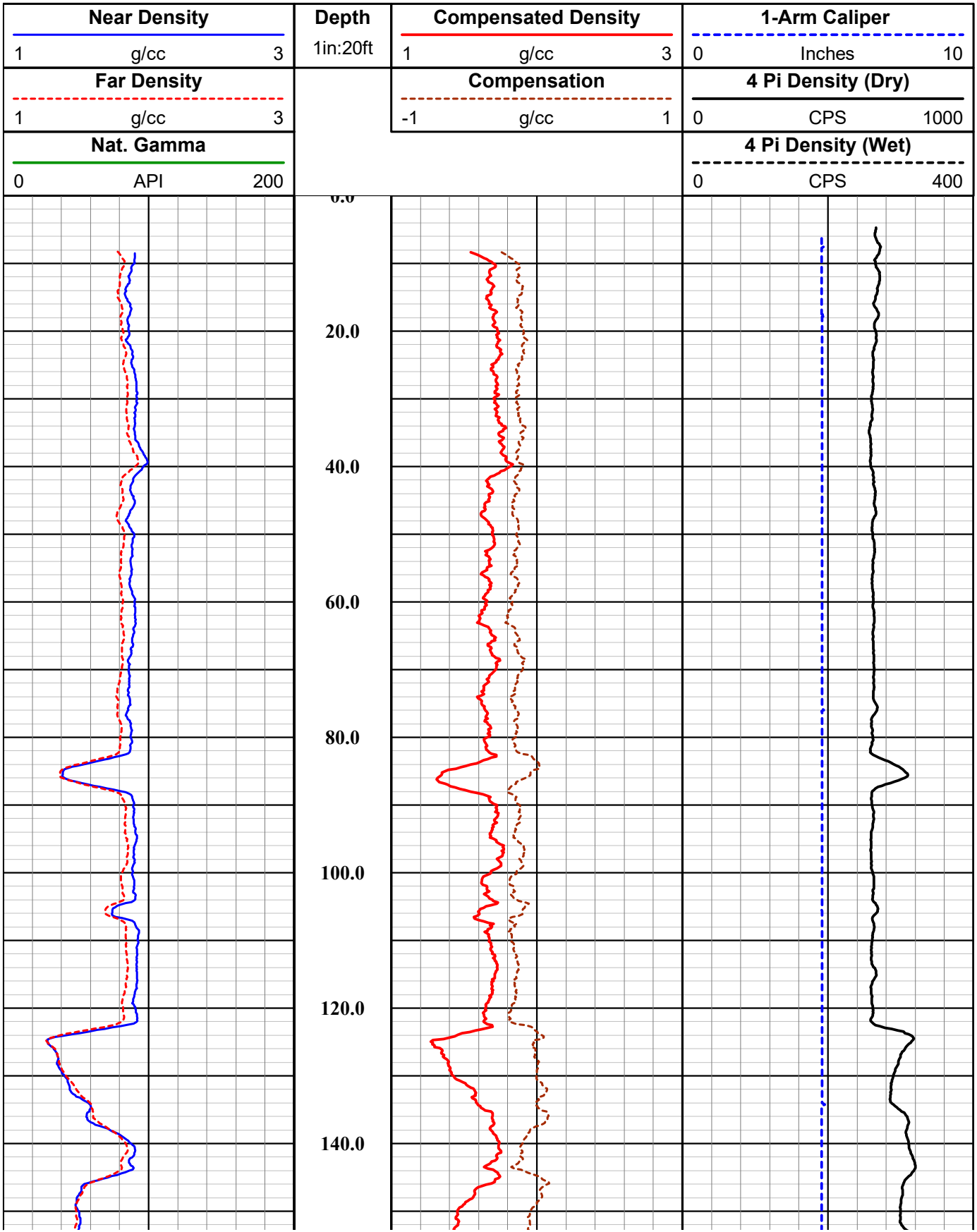

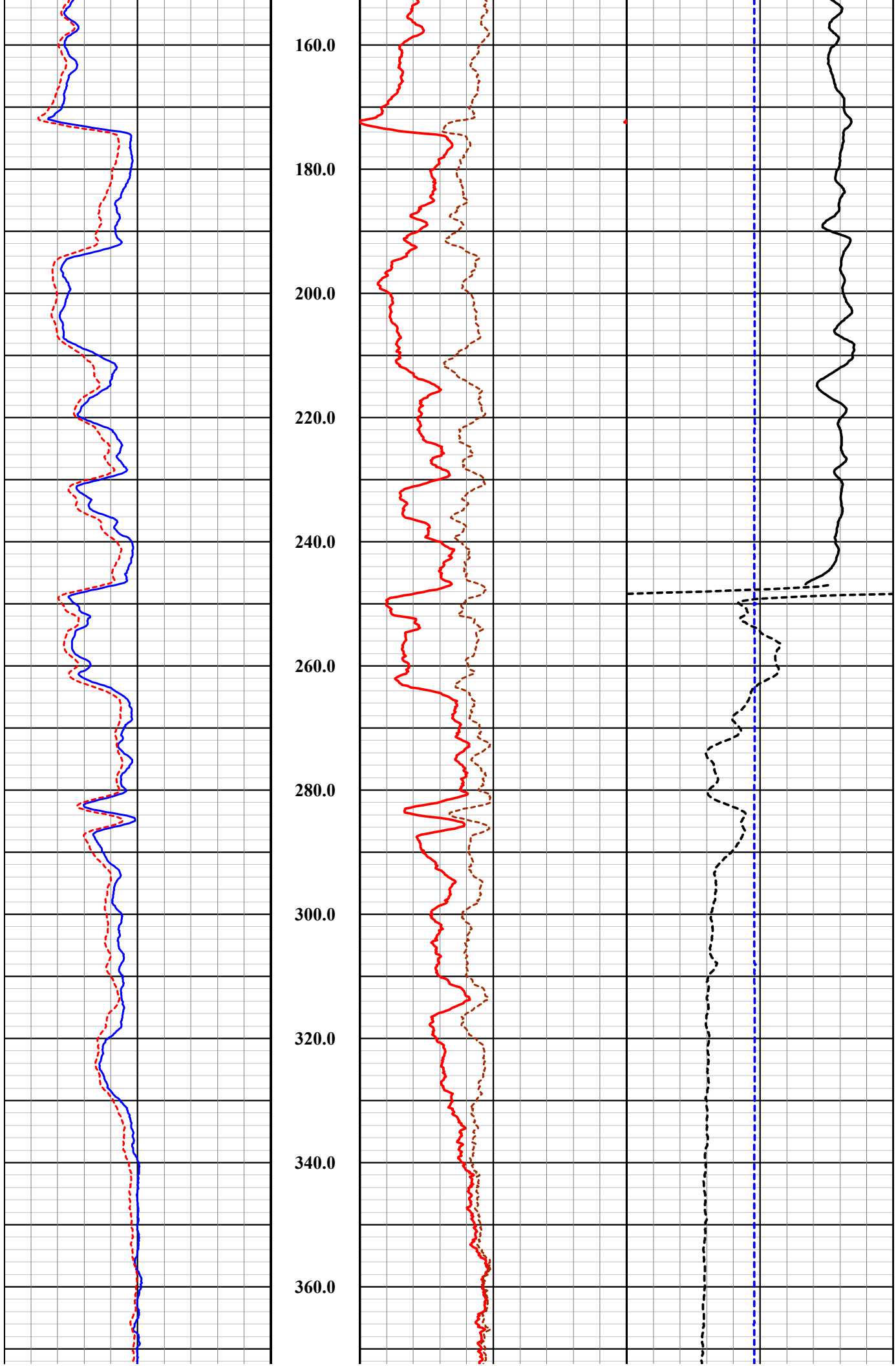
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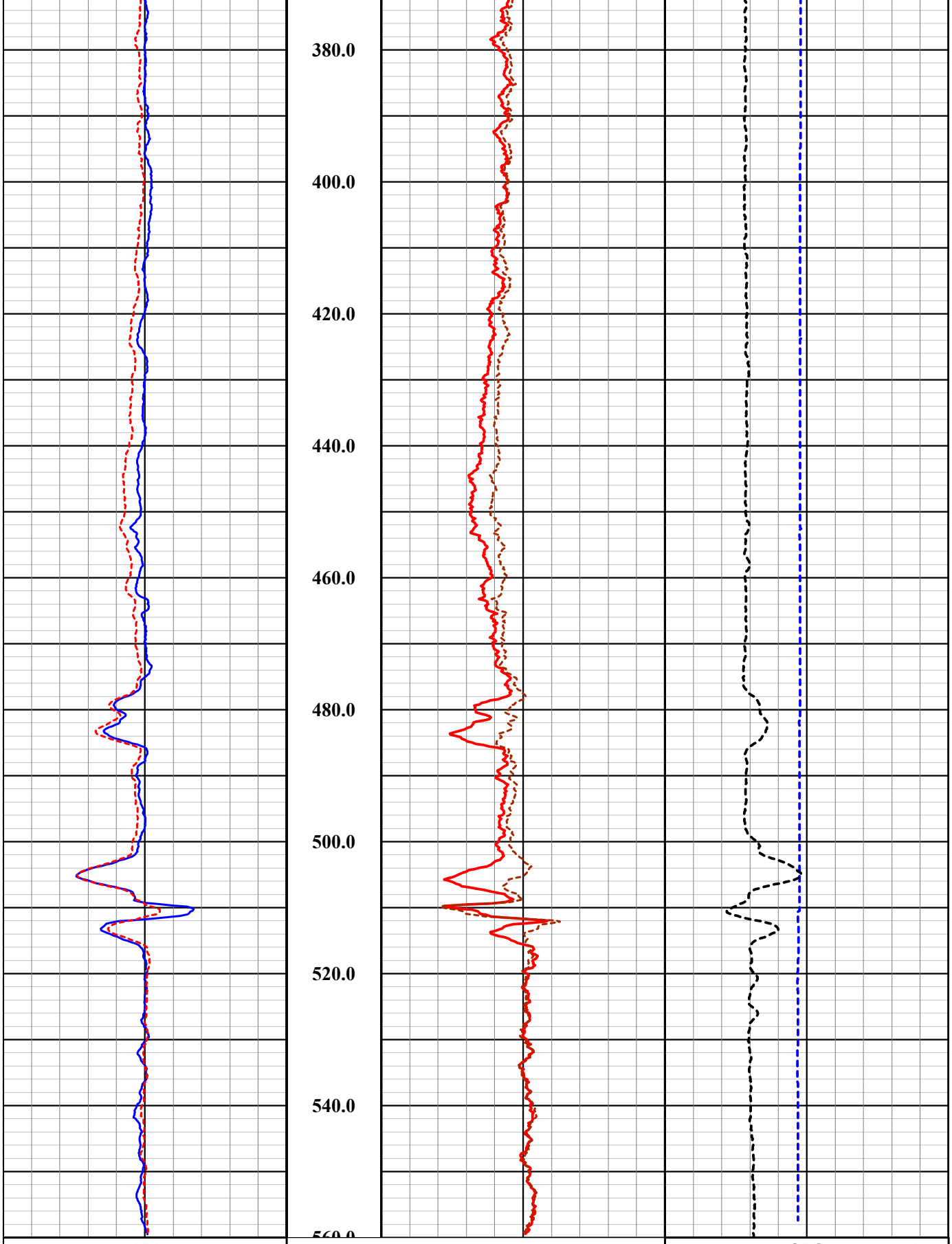

0 API 200		0 CPS 400
Nat. Gamma		4 Pi Density (Wet)
1 g/cc 3	-1 g/cc 1	0 CPS 1000
Far Density	Compensation	4 Pi Density (Dry)
1 g/cc 3	1 g/cc 3	0 Inches 10
Near Density	Compensated Density	1-Arm Caliper

1in:20ft
Depth

MSI 2GDA Density

Probe Top = Depth Ref.

Tool SN: 3082, 3925, & 5273

Single Conductor MSI Probe Top

Probe Length = 3.20 m or 10.50 ft
Probe Weight = 17.3 kg or 38.14 lbs

2GDA can only be collected logging up hole due to the caliper.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Guard Resistivity = 1.11 m (43.74 in)

1-Arm Caliper = 0.79 m (31.0 in)

Decentralization Band

Near/Far Detectors

Source

Source

1.60" or 41.0 mm Diameter

4 Pi Density Tool SN 6009

Probe Top = Depth Ref.

Probe Length = 1.57 m or 5.17 ft
Probe Weight = 4.99 kg or 11.0 lbs

Uses an Cs 137 Radioactive Source
Detector Assembly: Nal crystal with Photo-tube

Temperature Rating: 107 Deg C (225 Deg F)

Pressure Rating: 344.7 bar (5000 psi)

1.25 in or 31.75 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	O-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

State	ARIZONA

Final **Dual Density / 4 Pi Density Summary**

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	O-05
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: ALT 4RX SONIC
MORE: 1 ARM CALIPER

LOCATION

SEC TWP RGE

OTHER SERVICES
DUAL DENSITY
4 PI DENSITY

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	6-12-17	TYPE FLUID IN HOLE	FORMATION WATER
RUN No	1 & 2	MUD WEIGHT	N/A
TYPE LOG	SONIC-1 ARM CALIPER	VISCOSITY	N/A
DEPTH-DRILLER	1203 FT	LEVEL	~ 250 FT
DEPTH-LOGGER	1196 FT	MAX. REC. TEMP.	N/A
BTM LOGGED INTERVAL	560 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.25 FT
DRILLER / RIG#	NATIONAL DRILLING	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	M. QUINONES / E. TURNER	TOOL STRING/SN	ALT 4RX SONIC SN 5185
WITNESSED BY	NATIONAL	LOG TIME:ON SITE/OFF SITE	10:20 AM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	12 1/4 IN.	SURFACE	TOTAL DEPTH	5 IN.	F. GLASS	SURFACE	511 FT
2				5 IN.	PVC	511 FT	TOTAL DEPTH
3							

COMMENTS:

.

Tool Summary:

Date	6-12-17	**Date**	6-12-17	**Date**	6-12-17		
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	MSI 2GDA	**Tool Model**	ALT 4 RX SONIC	**Tool Model**	COMPROB 4 PI		
Tool SN	3083	**Tool SN**	5185	**Tool SN**	6009		
From	SURFACE	**From**	278 FT	**From**	SURFACE		
To	560 FT	**To**	560 FT	**To**	560 FT		
Recorded By	M. QUINONES	**Recorded By**	M. QUINONES	**Recorded By**	M. QUINONES		
Truck No	310	**Truck No**	310	**Truck No**	310		
Operation Check	6-12-17	**Operation Check**	6-12-17	**Operation Check**	6-12-17		
Calibration Check	6-12-17	**Calibration Check**	N/A	**Calibration Check**	N/A		
Time Logged	10:45 AM	**Time Logged**	11:25 AM	**Time Logged**	11:45 AM		
Date		**Date**		**Date**			
Run No.	4	**Run No.**	5	**Run No.**	6		
Tool Model		**Tool Model**		**Tool Model**			
Tool SN		**Tool SN**		**Tool SN**			
From		**From**		**From**			
To		**To**		**To**			
Recorded By		**Recorded By**		**Recorded By**			
Truck No		**Truck No**		**Truck No**			
Operation Check		**Operation Check**		**Operation Check**			
Calibration Check		**Calibration Check**		**Calibration Check**			
Time Logged		**Time Logged**		**Time Logged**			

Additional Comments:

Caliper Arms Used: N/A **Calibration Points:** N/A

E-Log Calibration Range: N/A **Calibration Points:** N/A

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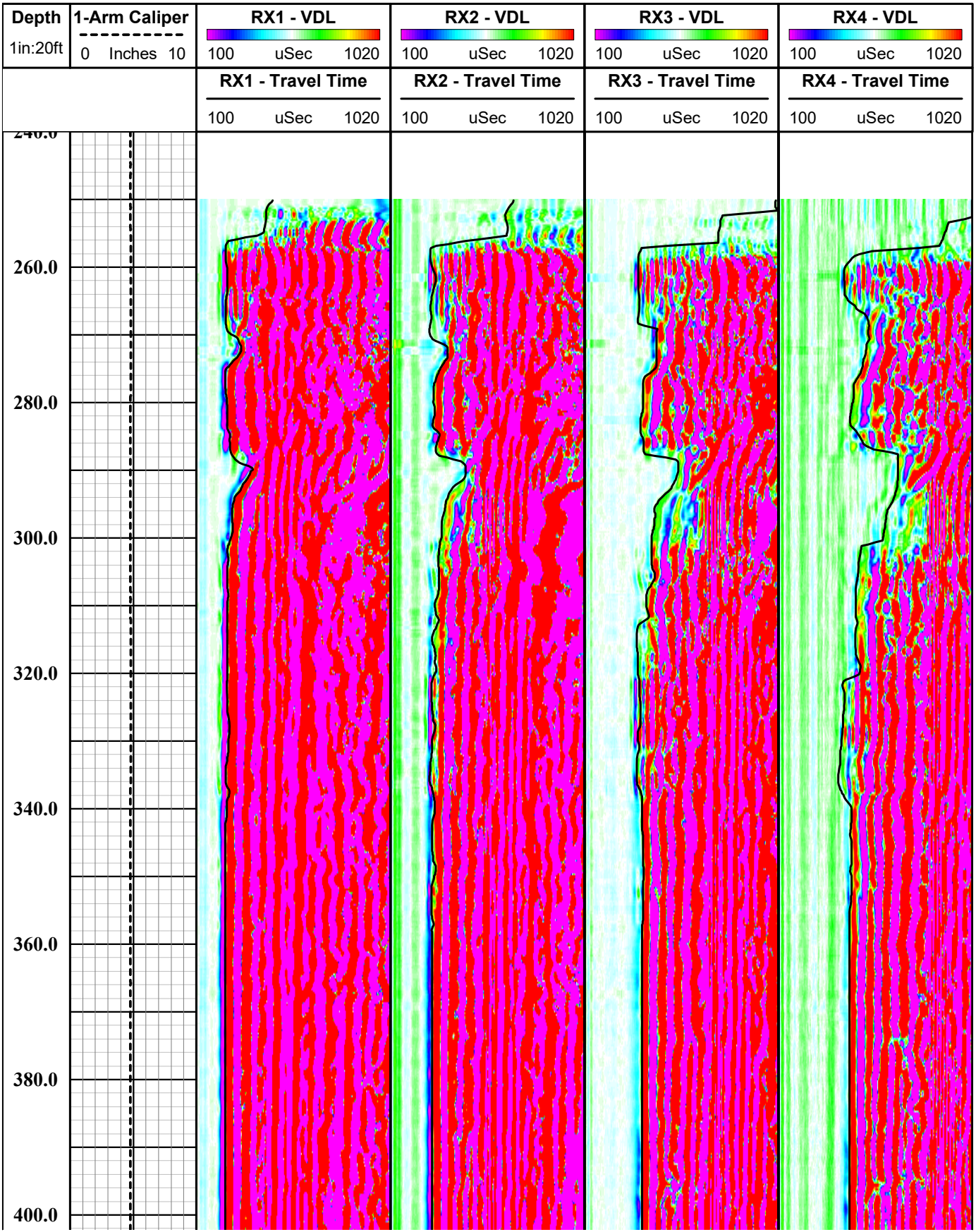
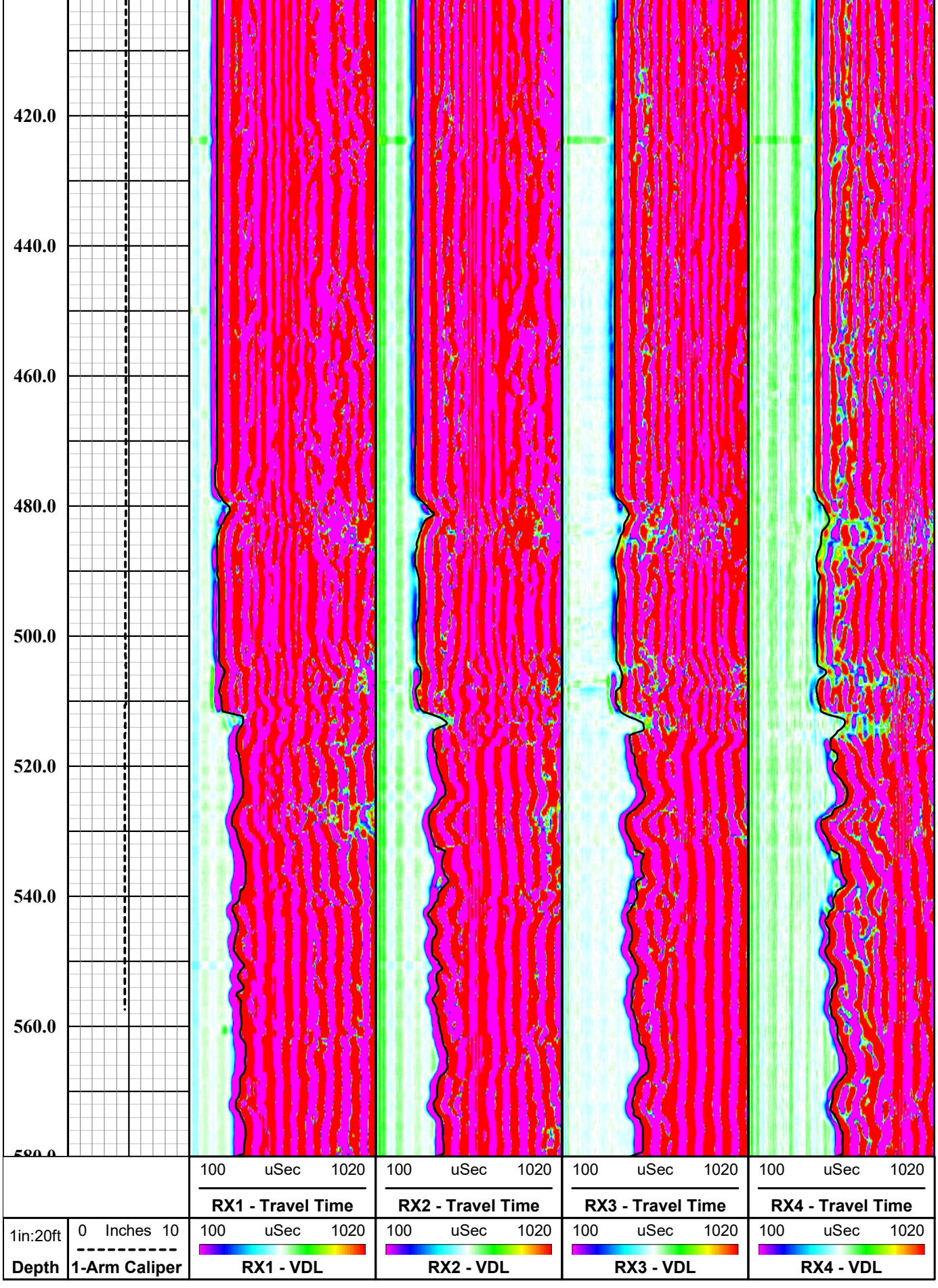




FWS50-4Rx Full Waveform Sonic Tool SN 5185

Probe Top = Depth Ref.

Four Conductor MSI Probe Top

Probe Length = 2.71 m or 8.9 ft
Probe Weight = ~18.0 kg or 39.6 lbs

Sensors: Ceramic Piezoelectric in Polyurethane potting

Transmitter Frequency: ~20 kHz resonant frequency

Rx - Rx Spacing: 0.2 m (7.9 in)

Typically ran centralized with external bow spring centralizers.

Can only be collected in fluid.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

Rx-4 Tx - Rx4 Spacing = 1.2 m (47.2 in)

Rx-3 Tx - Rx3 Spacing = 1.0 m (39.4 in)

Rx-2 Tx - Rx2 Spacing = 0.8 m (31.5 in)

Rx-1 Tx - Rx1 Spacing = 0.6 m (23.6 in)

Acoustic Isolater

Tx = Acoustic Transmitter

0.155 m or 6.25 in. - End of tool to center of Tx

1.97" or 50 mm Diameter

	Company FLORENCE COPPER

Southwest Exploration Services, LLC

borehole geophysics & video services

Well	O-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Sonic Summary

WELL ABANDONMENT MATERIAL RECORD

Project Name: FCI **Project #.:** 129087 **Geologist** C Pulver
Well No.: 0-05 **Date** 7-13-17

VOLUME CALCULATIONS

Depth of well Volume to be filled with sand [Ts]:		34	feet
Depth of well Volume to be filled with cement [Tc]:		511	feet
Well Inside Diameter [D]:		4.31	inches
Well Volume (V):	(D^2) 0.005454 =	0.10	Ft^3/Lin. Ft
Approx. Vol. of sand needed (Vs):	V*Ts=	3.4	Ft^3
Approx. Vol. of cement needed (Vs):	V*Tc=	51.1	Ft^3

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet

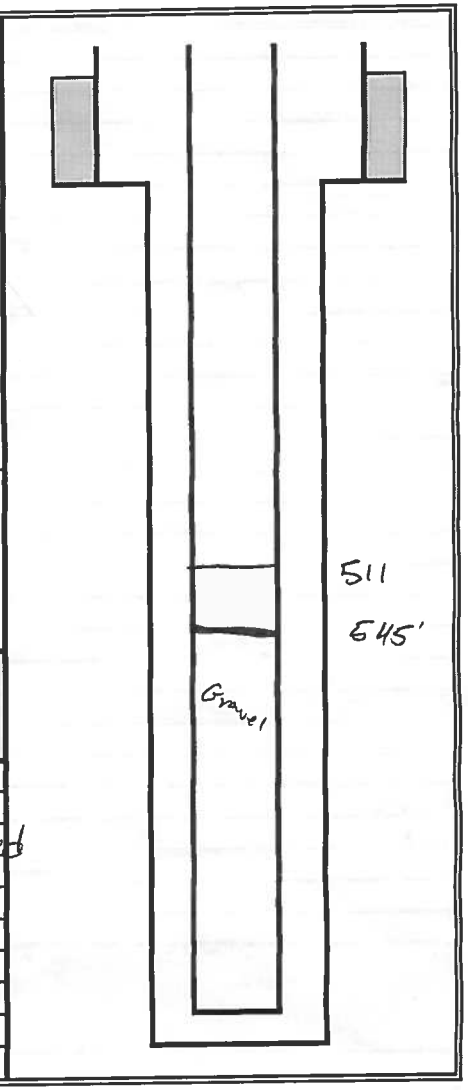
[1] Volume of bag (Ft^3) = bag weight/100

[2] Calculated depth = Previous Calculated depth - (v/A)

Bentonite Sack = 0.69 ft^3

Silica Sand Super Sack = 3000 lbs.

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1] (v) (ft^3)	Total Vol. of Bags (ft^3)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments
1	✓	300	3.0	3.0	515	520	#60 Silver Sand
2	✓		0.7	3.7	513	511	1-5gal pell-plug
3	✓		54	57.7	-29	0	Type V, blasted
						126	Tagged 7-18-17
4	✓		15.1	~~2472.8~~	-24	0	Type V



#3 Cemex Type V, 2 yards used, 14.4 lbs/gal
#4 Type V, 15-94lb bags, Used Vol = 15.1 weight = 14.1 lbs/gal

HALEY & ALDRICH